PHYSICS COLLOQUIUM:
Principles and Applications of Super Resolution Imaging to Studies of Cytoskeletal Dynamics in Living Cells

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Date:
10/8/2021

Time:
10:30 AM-11:50 AM

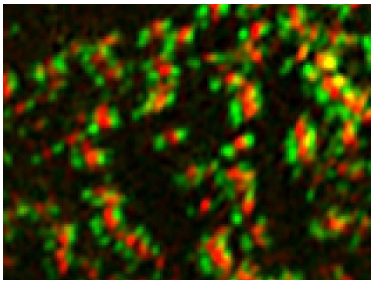
Link:
Please contact snsgradstaff@ucmerced.edu for the zoom information.

About The Speaker:

I received my BS in Physics at Jiaotong University in Shanghai China and my PhD in Biophysics from Johns Hopkins University. As Deputy Director of the Light Microscopy Core at the National Heart, Lung and Blood Institute of the National Institutes of Health, I oversee all core activities in Building 50. My core provides state-of-the-art microscopes, user training, experimental design, and image processing capabilities to assist investigators in experiments involving light microscopy. My own research revolves around my long-term interest in studying the cellular functions of myosin motors using optical methods. The scientific insights and optical expertise gained by conducting these studies helps me advise other researchers and guide them to the imaging modality best suited for their studies. In addition to working on important cell biological questions, I have led efforts to build and/or modify microscopes to meet the needs of specific research projects. Given the fast pace of light microscope development, I continuously strive to provide the Building 50 Core with cutting-edge imaging technology. These efforts include promoting cell biological studies using several “turn-key” super resolution microscopes, as well as extensive collaborations with premier imaging developers like Eric Betzig at Janelia/HHMI. Finally, for the past eight years I have organized an annual, four day-long NIH Super Resolution Imaging Workshop to teach and promote super resolution imaging technologies.

Abstract:

The recent development of several forms of so-called super resolution (SR) microscopy is providing cell biologists with powerful new tools to decipher cellular mechanisms. What all these SR modalities have in common is that, unlike even the fanciest conventional light microscope, they can resolve objects that are closer together than the diffraction limit of light (~250 nm). This enables visualization of previously unattainable molecular details within cells. They differ, however, in their maximal resolving power, as well as in their effectiveness for imaging living cells in real time.



This seminar will present an overview of all current forms of SR microscopy, explain how they work, and highlight their strengths and weaknesses. It will then show how two SR imaging modalities (SIM and Airyscan) that are ideal for live-cell imaging have revealed amazing new insights into the nanoscale cytoskeletal dynamics occurring within living cells.

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