SEMINAR ANNOUNCEMENT

國立中山大學物理系111學年度第二學期專題演講

Merging Microscopy and Photography

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Abstract:

Since the invention of the optical microscope, microscopic technology has continuously developed in a paradigm-shifting manner. 3D imaging and virtual optical sectioning have become the new norm with confocal microscopy. Multiphoton microscopy enabled by ultrafast lasers and nonlinear optics has led to a generational revolution. With the advent of super-resolution microscopies, such as Photo-Activated Localization Microscopy (PALM) and Stimulated Emission Depletion Microscopy (STED), the resolution of optical microscopes is now in the order of tens of nanometers. However, the common challenge is photon statistics. As a result, the image acquisition time is often too long to effectively perform detailed 3D imaging of large tissue samples.

With the advent of expansion microscopy, it is now feasible to include photography using relatively cost-effective light sheet photoexcitation and a macro-camera with a large field of view to capture large tissue images, enabling detailed revelation of small structures in large tissues. The new capacity provides solutions for 3D imaging of brain neurons and opens many future applications, such as pathological biopsy, digital reconstruction of biological samples, and in situ proteomics/transcriptomics.

Time: **Mar. 9, Thu. 15:10** **Venue:** **PH2006**