Imperial College London

http://www3.imperial.ac.uk/photonics/events

Photonics Seminars 2019

Tuesday, 30th July

Imaging and manipulation of excitable cells

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Light-sheet microscopy (LSM) excels in fast whole-organ acquisitions either in clarified mouse brains or intrinsically transparent zebrafish larva. In the first half of this talk, I will present our technical and optical solutions for microscope automation including autofocusing and Bessel beams. The data deluge is arguably one of the biggest challenges modern microscopy has to face and automation of microscope acquisition and data analysis has been pursued to this end. The results shown here demonstrate important steps towards maximizing information content in acquired data and should have a high impact in battling the data deluge.

Optogenetics, a combination of targeted light and gene delivery, has provided novel insights in cardiovascular research. A want of current methodologies, however, is the possibility to react to cardiac wave dynamics in real time. In the second half of my talk, I will present a platform for optical mapping and optogenetic stimulation of intact mouse hearts to monitor and control electrical activity in a closed-loop approach. The system comprises a wide-field mescoscope with a digital projector for customizable optogenetic activation. Cardiac function can be manipulated in a closed-loop fashion where the platforms allows for real-time intervention within 1ms. This platform promises an exciting new approach to investigate the (patho)physiology of the heart.

VENUE

Blackett 636

Commencing at midday