

## BioSyM Seminar Series 2017

### Multi-dimensional high-resolution imaging of Zebrafish organs using line-scan focal modulation microscopy

**Prof. Nanguang CHEN**

*Department of Biomedical Engineering, Faculty of Engineering, National University of Singapore*

*Email: [biecng@nus.edu.sg](mailto:biecng@nus.edu.sg)*

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**Time** : 4 pm to 5 pm  
**Venue** : Level 4, BioSyM Seminar Room



#### **Abstract**

Zebrafish combined with optical imaging can provide a huge amount of useful information for various biological and pharmaceutical researches. The relative small size of Zebrafish and its weak scattering/absorption properties allow three-dimensional imaging of the whole body with high spatial resolution. Wide-field optical microscopy and confocal microscopy are not ideal solutions for in-vivo visualization due to limited optical sectioning or imaging speed, respectively. We have developed line scan focal modulated microscopy, a proprietary technique highly suitable for Zebrafish imaging. It features parallel light sheet illumination and parallel detection, leading to much improved imaging speed. Spatial filtering is combined with focal modulation to for superior background rejection and high depth resolution. A prototype line scan FMM has been built and we have demonstrated an imaging speed of more than 100 frames per second while affording image quality comparable to confocal microscopy. High quality four-dimensional images of a beating Zebrafish heart have been acquired by the use of such a system.

#### **Short Biography**

A/Prof. Chen Nanguang is currently an Associate Professor of Biomedical Engineering at the National University of Singapore (NUS). He received his PhD in Biomedical Engineering in 2000 from Tsinghua University. He also received his MSc in Physics and BSc in Electrical Engineering in 1994 (Peking University), and 1988 (Hunan University), respectively. He joined the Optical and Ultrasound Imaging Lab at the University of Connecticut in 2000 as a postdoctoral fellow and then became an Assistant Research Professor in 2002. Since 2004, he has been a faculty member with NUS. His research interests include diffuse optical tomography, optical coherence tomography, and novel fluorescence microscopic imaging methods. He has published more than 70 papers in international leading journals and hold 5 international patents.