

Room G (Miami), 2F

Chair: Huilian Ma (Zhejiang University)

We3G

July 1 (Wed), 2026

Multi-modal Optical Technologies for Imaging and Sensing

15:00-16:30

We3G-1 **Invited** **15:00-15:30**

Label-Free Interferometric Imaging of Neural Activity and Its Application for Optoretinography

Tong Ling^{1,2,3}

¹Nanyang Technological University, ²Singapore Eye Research Institute, ³Singapore National Eye Centre

Nanoscale deformation accompanies membrane potential change and other functional activities in primary neurons and retinal cells. Detecting these deformations using label-free interferometric imaging techniques, such as quantitative phase imaging and phase-resolved optical coherence tomography, enables functional neuroimaging at the cellular level without electrodes or fluorescence markers, which can benefit the diagnosis of retinal degenerative diseases and the exploration of new ways to interface neurons all-optically.

We3G-2 **15:30-15:45**

High-Speed Bidirectional Illumination V Switching for Enhanced Surface Plasmon Resonance Microscopy

Inseop Byeon, Kwanhwi Ko, Hajun Yoo, Gwiyeong Moon, Donghyun Kim
Yonsei University

In this study, we optimized surface plasmon resonance microscopy (SPRM) using bidirectional illumination to enhance the visibility of live cells. The result with U2OS cells confirmed improved visualization of cellular contours with enhanced clarity.

We3G-3 **15:45-16:00**

Improving THz Image Quality via Self-Supervised Noise Reduction in THz-TDS

Han-Cheol Ryu¹, Seung-Hwan Jung¹, Inhee Maeng², Seung Jae Oh²

¹Sahmyook University, ²Yonsei University College of Medicine

We propose a self-supervised Noise2Noise framework: adjacent frequency images in the THz-TDS 3D spectral cube share spatial content but exhibit independent noise, providing natural training pairs.

We3G-4 **16:00-16:15**

All-PM Fiber-Based FMCW-LiDAR to Measure Depolarization of the Target Surface

Jaehwan Yang, Seonghyeon Ahn, Seokju Byun, Jaeheung Kim, Chang-Seok Kim, Taejoong Eom
Pusan National University

We propose an all-PM fiber-based polarization-sensitive FMCW-LiDAR. By utilizing 3D Degree of Linear Polarization (DoLP) imaging, this system quantifies surface depolarization, enabling enhanced target recognition even when objects overlap at the same range.

We3G-5 **16:15-16:30**

Distance Analysis for Dynamic Velocity Characterization in FMCW LiDAR

Wan-Chun Lin, Cheng-Chi Hsiao, Shih-Hsiang Hsu
National Taiwan University of Science and Technology

Accurate dynamic velocity measurement is achieved through a frequency-modulated continuous-wave (FMCW) light detection and ranging (LiDAR) system. A theoretical model describing the maximum measurable distance versus target velocity is derived and experimentally validated.