Room G (Miami), 2F | Chair: Han Cheol Ryu (Sahmyook University)

Th1G | July 2 (Thu), 2026
Precision Optical Sensing and Measurement | 08:30-10:00

Th1G-1 **08:30-08:45**

Co-Optimization of Aperiodic Spacing and Fishbone Grating Coupler for SiN Optical Phased Arrays Using Enhanced PSO

Yi-Ting Lin, Xiu-Ru Yang, Shih-Hsiang Hsu
National Taiwan University of Science and Technology

We propose a hybrid adaptive particle-swarmoptimization framework to co-optimize aperiodic antenna spacing and fishbone grating couplers in 32-channel SiN optical-phased-arrays at 1.55-μm wavelengths, achieving effective sidelobe suppression across 0°–40° beam-steering while maintaining fabrication robustness.

Th1G-2 **08:45-09:00**

All-optical Atomic Magnetometer for Dual-axis Magnetic Field Measurement with Polarizationmodulated Light Beam

Nuozhou Xu[1,2], Shudong Lin[1,2], Ying Zhou[1,2], Xiaoyu Li[1,2], Peiling Cui[1,2], Jixi Lu[1,2]
[1] Beihang University, [2]Hefei National Laboratory

This study presents an all-optical atomic magnetometer for dual-axis magnetic field measurement with polarization-modulated light beam. A modulated magnetic field is generated by light-shift, replacing traditional coils-based modulation. We demonstrate the feasibility of this scheme.

Th1G-3 **09:00-09:15**

Photometric Stereo with Parabolic Mirror for 3D Reconstruction of Specular Surfaces

Sang-Jun Kim[1,2], Hyun Woo Ko[1,3], Sunghyun Han[1,3], Hamong Shim[4], Seung Ah Lee[5], Paul Hongsuck Seo[3], Min-Chul Park[1,2,3], Seon Kyu Yoon[4]
[1]Korea Institute of Science and Technology, [2]Yonsei University, [3]Korea University, [4]Korea Photonics Technology Institute, [5]Seoul National University

This paper presents a parabolic mirror–based dark-field photometric stereo method for three-dimensional reconstruction of metallic and glossy surfaces. Under a controlled illumination geometry, the proposed configuration reduces specular reflection artifacts.

Th1G-4 **09:15-09:30**

AI-Assisted Reflectance Spectroscopy for Mural Pigment Degradation Detection

Rui Niu[1,2,3], Zunyue Zhang[1,2,3], Zhenzhou Cheng[1,2,3]
[1]State Key Laboratory of Precision Measuring Technology and Instruments, [2]Tianjin University, [3]Ministry of Education

We demonstrate an AI-assisted reflectance spectroscopy to detect the mural pigment degradation associated with chloride. The system integrates an automated spectral acquisition system with a convolutional neural network, achieving 92.8% accuracy in degradation detection.

Th1G-5 **Invited** **09:30-10:00**

Broadband Source-Driven Resonant Optical Gyroscope

Huilian Ma[1], Binjie Li[1], Yaqi Yong[1], Qingwen Liu[2], Zuyuan He[2]
[1]Zhejiang University, [2]Shanghai Jiao Tong University

This report details a broadband light source-driven resonant optical gyroscope, covering its operating principle, system architecture, relative intensity noise suppression, and challenges of low power utilization in high-Q resonators.