

Room D (Capri), 2F

Chair: Devin Brinkley (Taara Connect)

Mo1D

June 29 (Mon), 2026

Free-Space Optical Satellite Communications

13:00-14:30

Mo1D-1 13:00-13:15

Pilot-efficient Adaptive Equalization Enabled Synthetic Aperture Reception for Tbit/s-class Satellite-Ground FSO Links

Haoyu Zhang^{1,2}, Fang Dong^{1,2}, Chaoxu Chen^{1,2}, Yuan Wei^{1,2}, Jianyang Shi^{1,2}, Junwen Zhang^{1,2}, Nan Chi^{1,2}
¹Fudan University, ²Shanghai Engineering Research Center

A pilot-efficient, pre-trained adaptive equalization and combining framework for synthetic aperture reception without online retraining, achieving 3.6 Gbps net-rate gain in a 660-km 1.99-Tbit/s equivalent satellite-ground FSO link with fewer multiplications and 2% pilot overhead.

Mo1D-2 13:15-13:30

Dynamic Adaptive Beam Control Using a Variable-Focus Liquid Lens for Free-Space Optical Systems

Seyun Oh, Hoon Kim
Korea Advanced Institute of Science and Technology

We experimentally demonstrate adaptive beam divergence control in response to instantaneous pointing errors using a variable-focus liquid lens. The approach achieves lower outage probabilities than fixed beam divergence even with tenfold larger pointing errors.

Mo1D-3 Invited 13:30-14:00

Advancing 6G NTN for Integrating LEO Satellite Laser Communications with FSO and 5G NR

Wei-Ting Huang¹, Chi-Hsiang Hsu¹, Feng-Ti Chen¹, Jia-Hui Chou¹, Ting-Wei Zhang², Ming-Ta Yang², Hai-Han Lu¹
¹National Taipei University of Technology, ²Industrial Technology Research Institute

An OWC-fiber-FSO-5G NR hybrid system is employed to emulate an advanced LEO satellite-fiber-FSO-5G NR NTN. This system serves as a practical testbed and lays the groundwork for the realization of 6G NTN global communication networks.

Mo1D-4 14:00-14:15

Experimental Comparison Between Quadrant Detector and 4×4 Photodetector Array for Fast Beam Tracking in Free-Space Optical Systems

Mat T. Nguyen, Woohyeon Moon, Hoon Kim
Korea Advanced Institute of Science and Technology

We experimentally compare a quadrant detector and a 4×4 photodetector array for fast beam tracking in free-space optical systems. The results show that the photodetector array provides 40.7% faster beam tracking than the quadrant detector.

Mo1D-5 14:15-14:30

An Expanding-Window Network Coding Design for Satellite-to-Ground Optical Communications

Luozhang Liang, Bingli Guo, Jiayi Wang, Xuwei Xue, Yu Zhou, Shanguo Huang
Beijing University of Posts and Telecommunications

This paper proposes a packet-level forward error correction design named Expanding Window Random Linear Network Coding for satellite to ground optical links to significantly reduce latency and enhance throughput in long-delay channels.