



USC Viterbi School of Engineering

Seminar

Ming Hsieh Department of Electrical and Computer Engineering



Active meta-components for future dense integration of photonic ICs

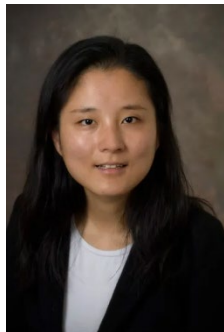
Tingyi Gu
Associate Professor, Electrical Engineering
University of Delaware

Friday, March 28, 2025
2:00pm – 3:30pm
EEB 132

<https://usc.zoom.us/j/98412540017?pwd=6IIk7ajVB4eYSvkTlZXK4Z4f5KybBW.1>

Meeting ID: 984 1254 0017
Passcode: 239623

Abstract: Photonic integrated circuits have found applications across disciplines of quantum computing, point-of-care diagnosis and optical interconnects. However, the efficacy of integrated photonics' system-level functionalities, such as optical interconnect I/O density and energy consumption, hinges on individual components' photon efficiency, performance, and scalability. On the foundry-compatible platform, we re-invent the photonic integrated circuits with sub-wavelength topology tailoring, new material integration and system-specific component designs. These advancements have facilitated control over multi-mode conversion, non-Hermiticity, nonreciprocity, mathematical convolution, and hyperspectral image classification. Furthermore, I aim to broaden the horizons of 'heterogeneous integration' by exploring the utilization of layered/2D materials for interfacing with silicon photonics. The combination of versatile semiconductor materials and advanced electromagnetic engineering promises to fundamentally reshape the design concepts of system-on-chip/system-on-panel technology, especially high throughput space communication and active imaging.



Bio: Tingyi Gu is an associate professor in electrical engineering at the University of Delaware. She received Ph.D. degree from Columbia University in EE. She was a PRISM postdoc fellow at Princeton Material Institute. She held positions at Bell Labs and Hewlett Packard Labs. Her group works on foundry-compatible silicon photonic components for optical communication and sensing, with a focus on optoelectronic reconfigurability and high-speed operation. She had served on committees for CLEO, FiO, OFC and IPC.

Gu published over 50 peer-reviewed journal articles, leading efforts published on Light: Science & Applications, eLight, Science Advances, Nature Comm., Advanced Materials, Nature Photon., etc. She has received Presidential Early Career Awards for Scientists and Engineers (PECASE), the National Science Foundation's Faculty Early Career Development Program (CAREER), the Air Force Office of Scientific Research Young Investigator Program (AFOSR YIP), the Army Research Office Young Investigator Program (ARO YIP), the Young Faculty Award from the Defense Advanced Research Projects Agency (DARPA YFA) and an Early Career Faculty Award from the National Aeronautics and Space Administration (NASA ECF).

Host: Dr. Wei Wu, wu.w@usc.edu