

Monolithically Integrated 3D Silicon Photonic Platforms

(Invited paper)

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ABSTRACT

This talk presents my group's progress in foundry-compatible, monolithically integrated multilayer silicon nitride-on-silicon (SiN-on-Si) photonic platforms. These SiN-on-Si photonic platforms contain several waveguide levels, and light can be routed vertically between the layers to realize 3D photonic devices and circuits. I will present our work on passive and active elements, including ultra-low-loss waveguide crossings, multi-layer grating couplers, polarization management components, and ultra-efficient Si depletion modulators. These advancements make possible the implementation of very large-scale photonic circuits for applications such as optical switching, phased arrays, and dense sensor systems.

Keywords: Integrated optics, silicon photonics, photonic devices