Integrated Optical Phased Arrays for AR Displays, Biophotonics, 3D Printing, and Beyond

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***Abstract*—Integrated optical-phased-array-based platforms, devices, and systems for applications in augmented-reality displays, LiDAR sensing for autonomous vehicles, optical trapping for biophotonics, chip-based 3D printing, and trapped-ion quantum engineering will be reviewed.**

Keywords—silicon photonics, integrated optical phased arrays, LiDAR sensing, augmented-reality displays, optical trapping, 3D printing, trapped ions

I. Review Of OPA-Based Platforms, Devices, Systems, And Applications

Integrated optical phased arrays (OPAs), fabricated in advanced silicon-photonics platforms, enable manipulation and dynamic control of free-space light in a compact form factor, at low costs, and in a non-mechanical way. This talk will highlight our work on developing OPA-based platforms, devices, and systems that enable chip-based solutions to high-impact problems in areas including augmented-reality displays [1-9], LiDAR sensing for autonomous vehicles [10-17], optical trapping for biophotonics [18-26], chip-based 3D printing [27-28], and trapped-ion quantum engineering [29-32].

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