

Monolithic Integration of III-V Quantum Dot Lasers on Silicon for Silicon Photonics

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The availability of silicon lasers is the key technology for the whole Si photonics industry. But the indirect bandgap of silicon is a severe limitation, and, despite recent advances, these devices will not, in the foreseeable future, outperform their III-V counterparts. Much effort has been directed toward hybrid integration of III-V lasers with Si photonics platforms. Although impressive results have been achieved, on a longer term, large-scale integration of photonics circuits will rely on monolithic integration of laser sources on silicon.

In this talk, I will review our recent progress made in the direct growth of III-V light sources on silicon. I firstly briefly address issues related to the III-V/Si substrates itself before moving to results on III-V light emitters, including edge-emitting lasers, superluminescent light-emitting diodes, and micro-disk lasers, monolithically integrated on Ge, Ge-on-Si, and Si substrates.