

Novel Materials and Processes for Silicon Photonics

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Silicon photonics and silicon nitride platforms have rapidly matured over the last decade and are now available from several foundries all over the world. While offering high yield, compatibility with mass manufacturing methods and an extensive library of different building blocks, they also still lack important functionality such as lasers. Other missing elements are linear phase modulators, non-reciprocal elements, single photon sources and detectors. In this talk, I will discuss how, through the integration of novel materials, and using new processes, this problem can be overcome. In particular, I will discuss our recent work on using nano-ridge engineering for monolithically integrating lasers on silicon. I will also discuss a powerful method for integrating ferro-electric materials such as PZT and BTO on photonic ICs for realizing phase modulators. Finally, I will discuss our recent work on the integration of 2D-materials on 300 mm silicon photonics wafers.

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References

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