

 Presentation

9 March 2023

Hybrid integration of color centers in nanodiamond with silicon nitride nanophotonics

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[Proceedings Volume PC12446, Quantum Computing, Communication, and Simulation III: \(/conference-proceedings-of-spie/PC12446.toc\)](#) PC124460A (2023) <https://doi.org/10.1117/12.2667096> (<https://doi.org/10.1117/12.2667096>)

Event: [SPIE Quantum West \(/conference-proceedings-of-spie/browse/SPIE-Photonics-West/SPIE-Quantum-West/2023\)](#), 2023, San Francisco, California, United States

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Abstract

Integration of quantum emitters with nanophotonic circuits is crucial for realizing scalable and highly connected multi-qubit photonic chip for quantum information processing. Here, we report our recent experimental progress on hybrid integration of silicon-vacancy centers in nanodiamond with silicon nitride nanophotonics. Enabled by an advanced pick-and-place technique and stepped silicon nitride deposition, we demonstrated deterministic and non-evanescent coupling between silicon-vacancy centers in a preselected nanodiamond and silicon nitride nanophotonic devices. Our method can be applied to virtually any color centers in diamond and pave the way towards high-yield and scalable fabrication of large-scale quantum photonic circuits for the study of many-body quantum physics and photon-mediated entanglement generation.

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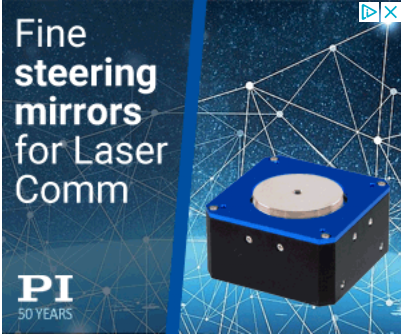
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[Shuo Sun](#) "Hybrid integration of color centers in nanodiamond with silicon nitride nanophotonics", Proc. SPIE PC12446, Quantum Computing, Communication, and Simulation III, PC124460A (9 March 2023); <https://doi.org/10.1117/12.2667096> (<https://doi.org/10.1117/12.2667096>).