

Abstract Submitted
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Hybrid Devices for Cavity QED in Solid State Systems BRENDAN SHIELDS, Harvard University Physics Department, NATHALIE DE LEON, Harvard University Chemistry Department, LUOZHOU LI, XUETAO GAN, DIRK ENGLUND, Columbia University Electrical Engineering Department, HONGKUN PARK, Harvard University Chemistry Department, MIKHAIL LUKIN, Harvard University Physics Department — Solid state emitters such as quantum dots or nitrogen vacancy (NV) centers in diamond are promising systems for implementing scalable quantum information technologies due to their stability and compactness. A key ingredient for scalability is the strong coupling of a narrow-band optical transition to a single photonic mode. This coupling can be achieved by placing the emitters in the mode of a small volume, high-Q optical cavity. Here we present an approach to deterministically place a Gallium Phosphide photonic crystal cavity at the location of an NV center near the surface of a diamond substrate and discuss its experimental implementation.

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