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Quantum optics with silicon-vacancy centers in diamond DENIS SUKACHEV, RUFFIN EVANS, ALP SIPAHIGIL, Physics Department, Harvard University, MICHAEL BUREK , School of Engineering and Applied Sciences, Harvard University, KAY JAHNKE, LACHLAN ROGERS, FEDOR JELEZKO, Institute for Quantum Optics and Center for Integrated Quantum Science and Technology, Ulm University, Germany, KRISTIAAN DE GREVE, NATHALIE DE LEON, CHRISTIAN NGUYEN, Physics Department, Harvard University, HONGKUN PARK, Department of Chemistry and Chemical biology, Harvard University, MARKO LONCAR, School of Engineering and Applied Sciences, Harvard University, MIKHAIL LUKIN, Physics Department, Harvard University, LUKIN'S LAB TEAM, LONCAR'S LAB TEAM, PARK'S LAB TEAM — The silicon vacancy is a color center in diamond with spectrally stable and bright optical transitions. We demonstrated two-photon interference from separated SiV centers, measured electronic spin lifetime (2.4ms) and coherence (35ns) via coherent population trapping, and carried out time resolved fluorescence measurements to identify electron-phonon relaxation mechanisms that limit the spin coherence time. Ways to extend spin coherence times and recent experiments where a single SiV center is coupled to a nanophotonic crystal cavity are also discussed.

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