

Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Spin-phonon coupling with silicon-vacancy centers in diamond nanostructures MICHELLE CHALUPNIK, CLEAVEN CHIA, SMARAK MAITY, GRAHAM JOE, BARTHOLOMEUS MACHIELSE, ELIZA CORNELL, WEIYI DING, BENJAMIN PINGAULT, Harvard University, SRUJAN MEESALA, California Institute of Technology, MARKO LONCAR, Harvard University — The integration of silicon-vacancy (SiV) color centers with diamond nanostructures has allowed demonstration of strong interfaces between photons and long-lived quantum memories. Leveraging the SiV's high strain susceptibility, recent work in the Loncar group has demonstrated coherent acoustic control of SiV spins in diamond using surface acoustic waves. Ongoing work in the Loncar group aims to show coherent interactions between single phonons and the SiV electron spin by fabricating optomechanical crystals with integrated SiV color centers. Engineering control of these interactions would pave the way towards the creation of hybrid quantum systems and phonon-mediated gates between SiV color centers.

Michelle Chalupnik
Harvard University

Date submitted: 30 Jan 2020

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