



PHYSICS AND ASTRONOMY COLLOQUIUM

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“Quantum information technologies with solid-state artificial atoms”

Abstract

“Single-photon emitters embedded within a solid-state host make natural candidates for quantum information processing nodes, as they combine: strong confinement of light for efficient light-matter coupling, readily controlled electronic spins for fast processing, and long-lived nuclear spins in the host material for memory. Semiconductor quantum dots in III-V materials and colour centres in diamond are among leading candidate platforms. In this talk, I will summarise our group's recent progress on both systems [1-3], and contextualise their use for quantum communication and computing technologies.”

[1] Gangloff et al. (2019). Quantum interface of an electron and a nuclear ensemble. *Science* 364 (6435)

[2] Jackson et al. (2021). Quantum sensing of a coherent single spin excitation in a nuclear ensemble. *Nature Physics* 17 (5)

[3] Debroux et al. (2021). Quantum control of the tin-vacancy spin qubit in diamond. [arXiv:2106.00723](https://arxiv.org/abs/2106.00723)

Wednesday, September 8, 2021

3:30 p.m.

Elliott Building Room 167