School of Physics and Astronomy Colloquium

Wednesday 28th May 2025 ● B13 Physics ● 3:00-4:00 PM

Refreshments served in C10 after the Colloquium

A quantum coherent spin defect in hexagonal boron nitride for quantum technologies

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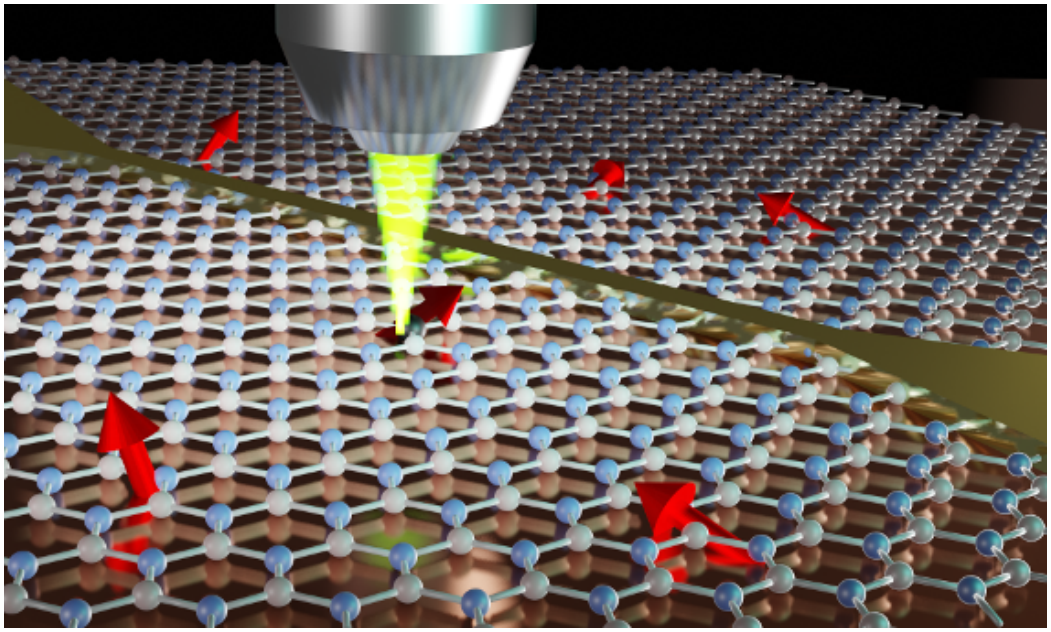

Abstract

Quantum networks and sensing require solid-state spin-photon interfaces that combine single-photon generation and long-lived spin coherence with scalable device integration, ideally at ambient conditions. Despite rapid progress reported across several candidate systems, those possessing quantum coherent single spins at room temperature remain extremely rare. In this talk, I will show quantum coherent control under ambient conditions of a single-photon emitting defect in hexagonal boron nitride. I will show how this carbon-related defect has a spin-triplet electronic ground-state manifold. I will reveal that the spin coherence is governed predominantly by coupling to only a few proximal nuclei and is prolonged by decoupling protocols. Finally, I will show how these results open routes to explore this defect type for nanoscale magnetometry.

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