

Abstract Submitted
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Automation of Spectroscopic Characterization of Quantum Defects¹ JENNA TEMPKIN, ANNA PAULSEN, ANNEMARIE EXARHOS, Lafayette College — A crystal defect is any imperfection within the repetitive and periodic structure of a crystal. There are many different types of defects, but we focus specifically on quantum defects, which are point defects that consist of one or a few atoms. In certain types of wide-bandgap semiconducting crystals, these defects emit fluorescence. Some of these defects fluoresce at visible wavelengths, so we can easily characterize and analyze the fluorescence using an optical spectrometer. These crystal defects can have important applications in quantum technology, including use as qubits for quantum computers, and in quantum sensing. This research aims to create a mostly automated and reproducible confocal fluorescence microscope to optically characterize these quantum defects in new materials.

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