

Analytical Seminar

“Why defective diamond is the best diamond”

While rich in detail, optical imaging in complex biological environments is challenging. The most valuable information at the single-molecule level often arrives with temporally and spatially overlapping background signals. Photo and chemical instabilities of current fluorophores and imaging probes further constrains productive imaging conditions. The unique optical properties of a fluorescence defect in nanodiamond, known as nitrogen vacancies (N_V^-), offer an opportunity to perform background-free imaging in complex environments at the single-particle level. The intensity of fluorescence from N_V^- centers can be modulated by the application of a resonant microwave field. In complex, heterogeneous systems this ability to selectively modulate the intensity of N_V^- centers using microwaves can be used to discriminate between fluorescence due to nanodiamonds and fluorescence arising from other sources. In this seminar I will describe experiments aimed at understanding the factors that influence N_V^- center fluorescence emission in nanodiamonds. I will also present results of N_V^- -center modulation via applied microwave fields for optimization of N_V^- centers as imaging probes complex biological systems.

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Thursday, February 18, 2016
12:15 p.m. in 1315 Chemistry