

Dan Tice (Chemistry and MS&E)

“Synthesis, Characterization, and Spectroscopy of Inverse Opal-Quantum Dot Systems”

Photonic crystals, such as inverse opals, are a class of metamaterials that interact strongly with light. This interaction arises from a periodicity in the crystal's refractive index on the order of optical wavelengths, and gives rise to interesting optical properties such as disallowed frequencies within the crystal (photonic bandgaps), and modified rates of spontaneous emission from emitters inside the crystal. Quantum dots, with a tunable emission bandwidth and wide excitation spectrum, represent a useful class of material to probe these crystals. I will present on the synthesis and characterization of metal-oxide inverse opals and chalcogenide quantum dots, methods for the incorporation of these quantum dots into the inverse opals, and some spectroscopy topics pertinent to these systems.