

## Understanding the nucleation and growth of colloidal quantum dots

In this talk I will describe a IV-VI and II-VI quantum dot synthesis platform based on substituted thio- and selenourea precursors, in which changing the precursor conversion kinetics leads to predictable changes in the final size and number of nanocrystals. By monitoring the synthesis with in situ absorption spectroscopy, small- and wide-angle X-ray scattering, and high-throughput robotic methods, we have begun to elucidate nucleation thresholds, size-dependent growth rates, and fundamental differences between analogous materials. I will discuss the implications of these insights for quantum dot-based solid-state lighting, which requires kinetically trapped CdSe/CdS heterostructures to obtain desirable luminescence properties.

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