



Monday, November 13, 2017, 12:00 pm

Seaver Science Library, Room 150

SSC Auditorium next to the library

Professor Anne Myers Kelley

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Exciton-phonon coupling in semiconductor quantum dots

Abstract:

Semiconductor quantum dots are approximately spherical, largely crystalline arrays of hundreds to thousands of atoms that have characteristic properties of both small chunks of condensed matter and large molecules. We use the concepts and language of both condensed matter physics and molecular spectroscopy to examine the exciton-phonon coupling (EPC) in these systems—the excitation of lattice vibrations that accompanies electronic excitation. The magnitude and frequency distribution of EPC influences a number of spectroscopic and photophysical processes of technological importance including the width of absorption and emission spectra, the rates of cooling of hot charge carriers, charge transfer across interfaces, and yields of multiple exciton generation from absorbed photons. This talk will discuss our studies of EPC in CdSe and related core/shell and alloyed quantum dots using primarily resonance Raman intensity analysis as a tool.

Suggested Reading:

Gong, K.; Kelley, D. F.; Kelley, A. M. *The Journal of Physical Chemistry Letters*. **2017**, 8(3), 626–630.

Lin, C.; Gong, K.; Kelley, D. F.; Kelley, A. M. *The Journal of Physical Chemistry C*. **2015**, 119(13), 7491–7498.

Hosted by Professor Anna Krylov

The scientific community is invited

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