

Quantum optics in arrays of nanocrystals

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Type: Experimental. Optics + data analysis.

Abstract:

Nanocrystals form one of the most fruitful and diverse sources of quantum states of light, states whose description require the term 'photon'. Recently, very interesting observations regarding the light emitted from ordered super lattices (arrays of nanocrystals organized on a lattice) suggest the emergence of super radiant emission. If true, this is an impressive manifestation of collective electron dynamics from a chemically synthesized system. Using top-of-the-line single-photon detector arrays we would you like to expand the experimental tests of this phenomenon specifically by observing high-order correlations.

The student will be tasked (with guidance and support) to design and build an optical setup to measure photon correlations with a new detector.