SEMICONDUCTOR NANOCRYSTALLITES AS ARTIFICIAL ATOMS: A SPECTROSCOPIC APPROACH

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Nanometer size crystallites of semiconductors are often called "quantum dots" or "artificial atoms" because of their predicted discrete electronic states and delocalized wavefunctions. The emerging spectrocopic picture of cadmium selenide nanocrystallites seems consistent with this description, but also shows some interesting complexities. In this talk we summarize a number of optical studies, including photoluminescence excitation, Stark and Zeeman experiments, and single dot fluorescence spectroscopy to build a quantum mechanical description of this system.