Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Polarization in Nano-Spherical Shell Arrays ETHAN BROWN, KIERAN MULLEN, University of Oklahoma — With the improvement in fabrication techniques on the micro- and nanometer scale, experimentalists are now able to produce atom-like electronic devices with their own unique spectra and shell structures. In particular, we may now examine periodic arrays of nanostructures without atomic analogues in which exchange-interaction, polarization, and separation may all be varied. Through the use of Monte Carlo simulation, in the classical case, and Schroedinger variation, in the quantum mechanical case, we search for novel properties in an array of singly-charged nano-spherical shells, sometimes called "quantum well quantum dots." A phase transition has already been shown to exist in a similar system consisting of nano-rings, making the same in nano-spherical shells seem a distinct possibility. Such control of the electron on the nano-scale may prove useful in optical and spin- or charge- based quantum information schemes.

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Date submitted: 25 Nov 2006 Electronic form version 1.4