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**Carbon Nanotube/CdSe Nanoparticle Hybrid Materials: Synthesis and Optical Properties** AUSTIN AKEY, CHENGUANG LU, WEI WANG, IRVING HERMAN, Columbia University — Carbon nanotubes present remarkable opportunities for construction of advanced nanomaterials with unique properties, for use in sensors and optoelectronic device applications. Chemical attachment of nanoparticles to nanotubes has thus far resulted in low coverage; direct nucleation of particles on the tube sidewalls leads to a loss of control over particle size and monodispersity. We report the synthesis of novel heterostructures composed of single-walled carbon nanotubes and chemically attached, monodisperse cadmium selenide nanoparticles. The hybrid material is stable and resists aggregation; TEM and SEM characterization shows the nanotubes to be densely covered in nanoparticles. The nanoparticles used range in size from 3.5 to 6.0 nm in diameter, and exhibit strong quantum confinement. The hybrid materials are being investigated in the interest of finding new optical and/or electronic properties, which has led to the observation of an anomalously small Stokes shift in the photoluminescence. Results of ultrafast optical spectroscopy measurements on this phenomenon will be presented.

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