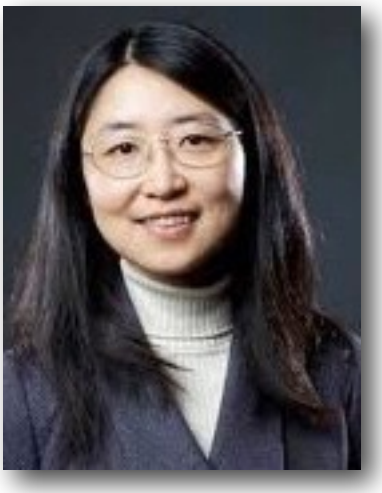
UCLA Chemistry & Biochemistry

Physical Chemistry Seminar



Professor
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Fundamental Properties of Chalcogenide-Type Nanostructures

This presentation will first discuss the cadmium chalcogenide nanowires. Cadmium chalcogenides have direct band gaps that span from infrared to visible range. They possess excellent light absorption capability and superior photosensitivity, and thus are outstanding materials for developing nanoscale electronic and optoelectronic devices. As the device applications strictly depend on their intrinsic material properties, therefore, it is of paramount importance to elucidate their fundamental physical properties. I will present the basic structural, electrical, and optical properties, respectively, of CdS and CdTe nanowires.

Next, I will describe the topological insulating nature of Sb_2Te_3 nanowires grown by chemical vapor deposition with different cross-sectional areas. The magnetoresistance measurements is supported by nanoscale angle-resolved photoemission spectroscopy, indicating that the observed Aharonov-Bohm type oscillations in the presence of parallel magnetic field arise from dominating TI surface transport in the *p*-type Sb_2Te_3 nanowires. The analysis of the magnetoconductance data with a magnetic field perpendicularly oriented to the wire axis reveals universal conductance fluctuations with a characteristic correlation field B_c. The extracted coherence length and the temperature dependence of the conductance fluctuation provide information on the coherent-transport of TI surface states and the quasi-one-dimensional character of the transport along the wire axis.

Monday, May 16, 2016
4:00 P.M.
2033 Young Hall

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