Optical Spectroscopy of Individual Nano-materials with Defined Atomic Structure

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When the characteristic length of a material shrink to 1 nm scale, many distinct physical phenomena, such as quantum confinement, enhanced many-body interactions, strong van der Waals inter-material couplings and ultrafast charge separation, will appear. To investigate the related fascinating low-dimensional physics, we need a tool to quantitatively link the atomic structures to the physical properties of these very small nano-materials. In this talk, I will introduce our recently developed in-situ TEM + high-sensitive ultrafast nanooptics technique, which combines capability of structural characterization in TEM and property characterization in nanooptics on the same individual nano-materials. Several examples of using this technique to study the 1D carbon nanotube system and 2D atomic layered systems will be demonstrated.

References:

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