CIQM CENTER for INTEGRATED QUANTUM MATERIALS

Research Exchange Seminar

Yuan Yang

Heller Group

Harvard University

A Comprehensive Understanding of Raman Spectrum in One and Two Dimensional Conjugated Carbon Systems

Raman spectroscopy is very widely used to characterize graphene samples. The understanding of the spectroscopy depends critically on the underlying theory. For a doze of years, a Raman scattering narrative theory called "double resonance" has developed, created for and applied only to graphene, carbon nanotubes and graphite. It relies heavily on post-photoabsorption electron-phonon scattering, which is intrinsically a non Born-Oppenheimer, nonadiabatic process, and neglects the nuclear position dependence of the electronic transition moment. In the talk, we will show electron-phonon scattering is in fact not needed to explain the Raman spectra, the transition moment coordinate dependence explains and predicts graphene spectroscopy more directly and simply. This general understanding also applies to the one dimensional equivalence of graphene, polyacetylene system.

January 28, 2015
12:00 PM MD 119

Pizza will be served

VE RI TAS

1867 HOWARD UNIVERSITY

MIT

Museum of Science

NSF

http://ciqm.harvard.edu