

Natural Sciences Seminar Series

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March 1st, DS 175, 1:30-2:30pm

**Characterization of Micro- and Nano-structured Materials Using
Raman Spectroscopy**

Raman Spectroscopy (RS) is a non-destructive and powerful analytical and research tool, which provides fingerprint for materials identification. It is used in many fields and for a wide range of applications such as investigation of semiconductors, superconductors, optical materials, pharmaceuticals, medical diagnostics, forensic science, polymers, thin films, and nano-structured materials. Interest in Raman spectroscopy has led to development of several Raman scattering techniques including; Surface Enhanced Raman Scattering (SERS), Tip-Enhanced Raman Scattering (TERS), Near Infrared Raman Scattering (NIR-RS,) and Raman Tweezers. A review of Raman spectroscopy process will be presented, as well as advantages and shortfalls of this laser spectroscopy technique. Specific data showing our Raman Scattering analysis of SiC epi-layers as well as Raman analysis of carbon nanotube materials that we produced by CO₂ laser processing of SiC will be presented. A depth profiling model based on Confocal Raman spectroscopy will be discussed and it will be compared with the experimental depth profiling results for SiC samples.