

## **275f Nanostructuring of Diamond Matrices and Substrates by Carbon Nanotubes**

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Diamond matrices and substrates nanostructured by the in-situ growth of single wall carbon nanotubes (SWNTs) via thermal and plasma-enhanced chemical vapor deposition (PE-CVD), have been studied by a combination of micro-Raman imaging, and scanning and atomic force microscopy. Thermal CVD growth of SWNTs has been carried out using carbon monoxide (CO) or ethanol as carbon precursors, whereas PE-CVD growth was carried out either with methane or ethanol as precursors. We will discuss in detail the interfacial region between diamond and the catalytically grown (using bimetallic Co and Mo) SWNTs. Defects (particularly those that are sp<sup>3</sup>-bonded) on the nanotube sidewalls have been probed by micro-Raman spectroscopy to study their interaction with diamond during chemical vapor deposition. These results will be discussed together with thermal conductivity measurements on the diamond-SWNT nanocomposites. This work was performed in collaboration with A. Goyal and C. Yu from the Department of Chemistry, New Jersey Institute of Technology, and M. Sosnowski from the Department of Electrical and Computer Engineering, New Jersey Institute of Technology.