

## Raman spectroscopy from micro to nano: exploring carbon nanomaterials

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Optics in the visible is associated with wavelengths in the range of hundreds of nanometers to microns. The use of optics to address nanoscience is, therefore, the use of a large probe to sense a tiny material. Nanotechnology offers some tricks to overcome this difficult task, such as exploring resonance phenomena playing against the very low efficiency of a single nanostructure, or using plasmonics to localize light into nanometer sized areas. In this talk I will discuss these issues addressing the evolution of Raman spectroscopy applied on carbon nanostructures. Carbon nanotubes, graphene and amorphous carbons are prototypes for the development of nanometrology due to their unique mechanical and electronic structures. Dimensionality, quantum confinement and environmental effects play a role enriching the exploration. Applications in cross-related fields, such as biomedicine and soil science demonstrate the power of the technique.

