

**Seminario della vincitrice della procedura selettiva RTDB - SSD FIS/03 SC 02B1 - Dr.ssa
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Titolo:

Field-enhancement for spectroscopy and nano-imaging in the mid-infrared

Abstract:

Electromagnetic radiation confined in deeply subwavelength regions, shows an increase in the associated electric field strength, which results in enhanced light-matter interaction, thus leading in enhanced emission and absorption probabilities. Plasmonics, i.e. the resonant coupling between electromagnetic waves and collective oscillations of free electrons, is the most promising approach to achieve sub-wavelength concentration of electromagnetic fields in close proximity to the molecule. The term "optical antennas" is used in this context to address those nanostructures that, in analogy with their radio-frequency counterparts, are specifically designed to convert propagating radiation to intense localized energy, and vice versa.

I will discuss a number of experiments where I have engineered and exploited nanostructures to create hot-spots allowing infrared spectroscopy at the nanoscale or on a reduced number of molecules.