UNIVERSITÁ DEL PIEMONTE ORIENTALE
DIPARTIMENTO DI SCIENZE E INNOVAZIONE TECNOLOGICA

EVENTI DiSIT

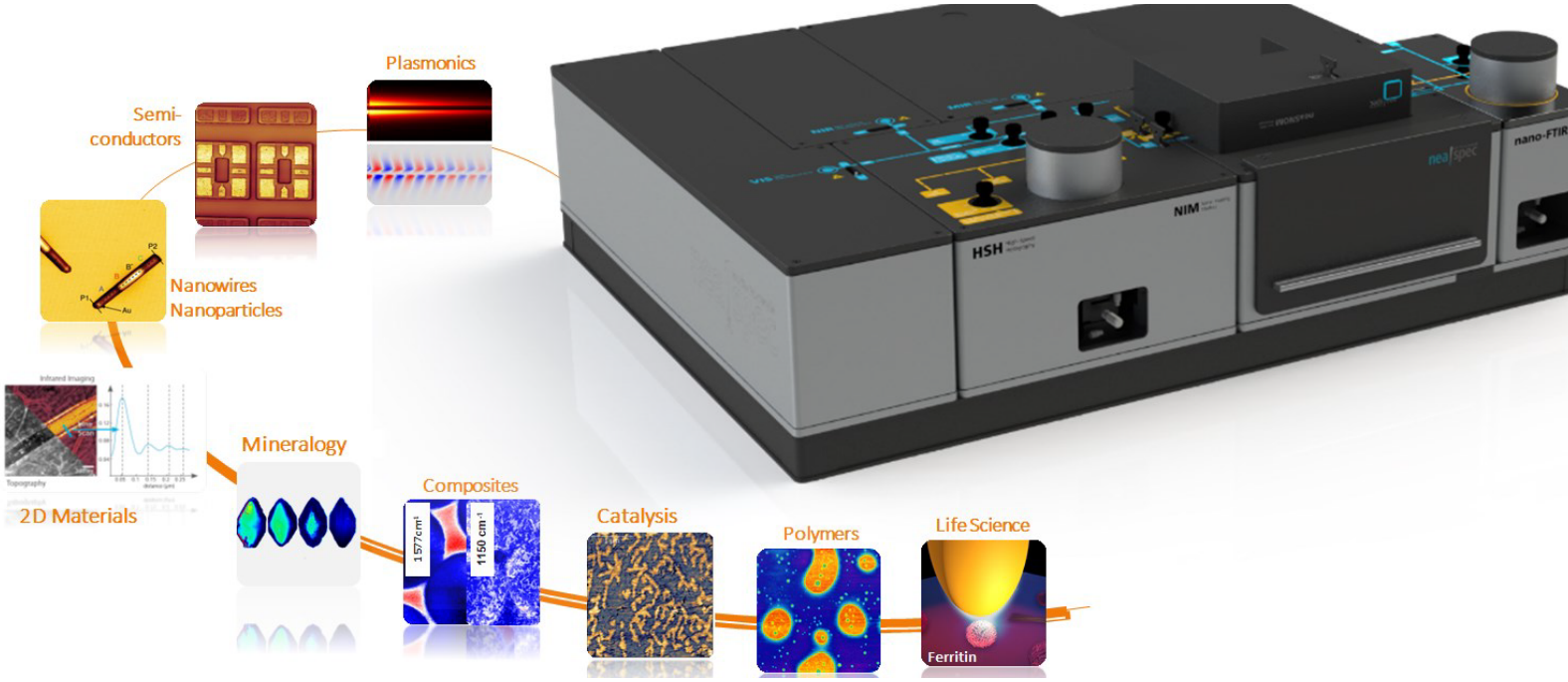
Seminario
16-09-2022
11:00-13:00
Aula 203

Scattering-Type Scanning Near-Field Optical Microscopy for Optical Microscopy and Spectroscopy at 10 nanometer resolution

Dr. Philip Schaefer
Sales Application Engineer, Attocube Systems AG, ALX: nanoscale analytics Eglfinger Weg 2, 85540 Haar (Munich), Germany

Dipartimento di Scienze e Innovazione Tecnologica (DiSIT),
Dipartimento per lo Sviluppo Sostenibile e la Transizione Ecologica (DiSSTE)

Aggiungi gli eventi
al tuo calendario
https://tinyurl.com/yr46hnkp



ABSTRACT:
Scattering-type Scanning Near-field Optical Microscopy (s-SNOM) is a scanning probe approach to optical microscopy and spectroscopy bypassing the ubiquitous diffraction limit of light to achieve a spatial resolution of about 10 nanometers. s-SNOM employs the strong confinement of light at the apex of a sharp metallic AFM tip to create a nanoscale optical hot-spot. This defines the high resolution that can be achieved independent from the used wavelength from the UV, visible, IR, even up to the THz spectral region. Interferometric detection of the scattered light from the hotspot gives access to local optical properties like absorption and reflection, allowing FTIR spectroscopy on the 10 nm length scale for nano- chemical identification and compositional mapping of various organic and inorganic materials. The optical near-field hotspot can also be employed to excite and detect plasmon polaritons which enables the quantification of local free carrier properties in doped semiconductors.
Using broad-band sources in the mid-IR spectral range, nanoscale Fourier-transform spectroscopy (nano-FTIR) can now be used for chemical identification and mapping on polymer nanostructures, metal-organic frameworks, composite- and bio-materials. Fast nano-FTIR spectroscopy based hyperspectral imaging (HSI) can yield chemical compositional maps on a few tens of nanometer scale. nano-FTIR has a proven unprecedented sensitivity for the non-invasive detection of single proteins and lipid monolayers.
s-SNOM and nano-FTIR are now established and essential techniques for modern nanoscopy and have routinely been used in applications such as chemical identification, free-carrier profiling, or the real-space mapping of propagating plasmons and other polaritons. Impactful examples will be shown and discussed in my talk.

EVENTO APERTO A:
Docenti, Borsisti, Assegnisti, Dottorandi, Studenti

Il seminario è promosso dal Prof. Michele Laus.

Aggiungi gli eventi
al tuo calendario
https://tinyurl.com/yr46hnkp