Quantum Design

LATIN AMERICA

Raising The Science

Materials Science

Spectroscopy

Cryogenics

Optics

Nanoscience

Sample Synthesis

Biotechnology & Chemistry

Industries

Microscopy

Quantum Technology

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Neaspec

Germany

Quantum Design
LATIN AMERICA

Neaspec has gained worldwide attention in the scientific community for inventing a series of breakthrough technologies in nanoscale analytics. Founded in 2007 by the world's leading experts of near-field microscopy as a spin-off from the the Max-Planck-Institute of Biochemistry, neaspec's engineers have developed the neaSNOM microscope, an easy-to-use optical near-field microscope platform using ground-breaking and patented optical background-filtering techniques.

neaSNOM combines the best of two worlds – the nanoscale resolution of atomic force microscopy (AFM) with the analytical power of visible, infrared and even THz imaging & spectroscopy. At a spatial resolution of only 10nm, the method only requires standard AFM sample preparation and is non-destructive. This opens a new era for modern nano-analytical applications such as chemical nano-identification (IR), nano-plasmonic field mapping (VIS & IR) or free charge carrier nano-mapping (THz).

Key features:

- High speed near field imaging
- Near field spectroscopy (nano FITR)
- Broadband usability: VIS-IR-THz spectral range
- Optical amplitude and phase measurement
- Reflective optics for superior usability
- Patented dual port design for correlation microscopy and time resolved spectroscopy
- Modular system design for unique configuration flexibility
- Ultrabroadband nano FTIR: Best compatibility with IR synchrotrons
- Accepts visible, infrared & even THz illumination wavelength
- Positioning sensors (resolution < 10nm)
- No chromatic aberration focusing with 0.46 NA
- Simultaneous focusing and detection of two independent light sources
- neaspec's proprietary AFM design boosts optical microscopy and nano spectroscopy
- Fully compatible with conventional ultrafast laser technology
- Requires nondispersive optics and dual beam path design
- Supports advanced AFM modes:
  - Photo thermal expansion (PTE)
  - Conductive AFM (cAFM)
  - Kelvin probe force microscope (KPFM)
  - Tip Force Mode (TFM)

Most common applications:

- Detection of doping gradient between to adjacent segments
- Detection of doped subsurface layer
- Contact free quantification of free carrier concentration
- Study of electron transparent lamella prepared from doped ZnO nanowire
- STEM imaging of nanopores and grain boundaries
- Observation of surface plasmons
- Extraction of local material properties, e.g. conductivity, intrinsic doping, defects
- Direct control of propagating surface plasmons on graphene
- Highly active research field:
  - Layered hetero structures
  - Ultrafast electron dynamics
- Nanoscale resolution of graphene boundaries
- Sign change in photo current at grain boundaries
- Sensitive to local conductivity inhomogeneities
- PN junctions are highlighted

BIG AREAS

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see the nanoworld
neaspec