A.P.E. Research
NANOTECHNOLOGY

TriA SNOM – Scanning Near Field Optical Microscope

Tools for Microscopy and Nanotechnologies

TriA SNOM
Scanning Near Field Optical Microscope

The scanning near-field optical microscopy technique (also known as **SNOM or NSOM**) is a member of the scanning probe microscopy family, allowing the detection of the optical properties at resolutions below the optical diffraction limit.

TriA SNOM system is a powerful and well-designed universal scientific SNOM applicable to almost all areas to characterize any type of sample surface, biological and not biological samples. Based on scanning probe technology brings a small optical probe very close to the sample surface, in the region called "near-field", and it allows the collecting of optical signals providing image resolution below 100 nm.

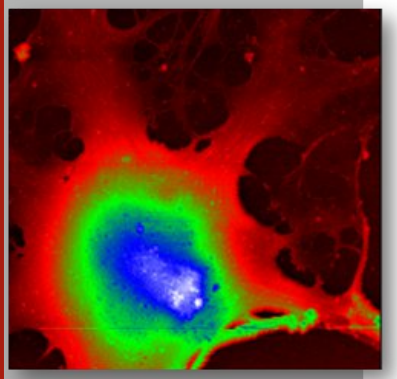
TriA SNOM combines the potentials of scanned probe technology with the power of optical microscopy. TriA SNOM design incorporates the “share force” feedback technology combined with precision sample scanning stage in order to ensure superior tip-sample positioning control.

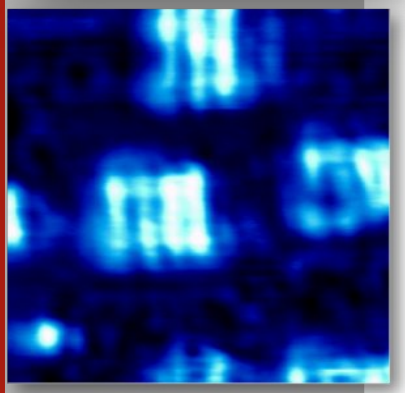
The method allows the simultaneous acquisition of both the surface map topography and the optical signals. Up to 3 different optical signals can be simultaneously collected and analysed.

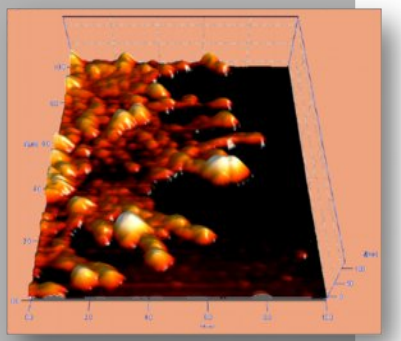
The optical set-up can accommodate different dedicated objectives, filters for a wide range of applications, colour video system for fine sample focus and conventional high-quality optical viewing of the sample region selected for SNOM

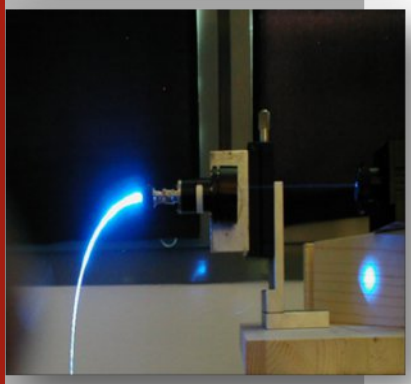
Both transmission and reflection paths have integrated and independent high-performance photo detectors, ensuring robust and reliable operation for separate or simultaneous transmission and reflection measurements from the visible (VIS) to near infra-red (NIR) range.

The system has been designed to support a wide variety of external laser excitation sources as well the integration with most modular external CCD/Imaging spectrometer systems.









SNOM Working modes:

SNOM Topography: The image obtained is the result of signals acquisition in xyz axis that allows to measure detailed surface morphology and nanostructures on a nanometric scale.

SNOM Optical Reflection: image is obtained with near-field light that interacts locally with a superficial layer of the sample, giving information on structures confined within 30-100 nm (depending on the tip aperture) below sample surface.

SNOM Optical Transmission: the image results from the light transmitted through the whole thickness of the sample. While in conventional optical microscope all the sample is illuminated, SNOM near-field light interacts only locally producing signals point by point. SNOM optical transmission images are comparable with conventional optical images but their lateral resolution is more than 10 times higher.

SNOM Optical Back-Reflection: image is created by the near-field light that is back-reflected into the fiber, after local interaction with the sample surface.

TriA SNOM Scanning system

Scanning stage with absolute positioning system and strain gauge sensors.

Standard scanner technical data:

X-Y scan size:
100 x 100 µm (high voltage mode);
10 x 10 µm (low voltage mode)
Resolution high voltage mode:
Closed loop: 2 nm,
Open loop: 0.2 nm
Closed loop linearity: 0.1%.

Z scan size:
10 µm (high voltage mode)
1 µm (low voltage mode)
Resolution: 0.16 nm (high voltage mode),
0.02 nm (low voltage mode).

*Based on specific demands other scanning ranges can be combined by the user in different configurations * .*

Maximum sample size: it can accommodate samples with different geometries and sizes up to 30 mm diameter.

SPM Control System

It is composed by a digitally controlled analog feedback that combines the flexibility of computer controlled parameters with the high resolution and low noise of an analogue implementation. This detection scheme provides sub-nanometric vertical resolution in the images and all collected signals are distortions free.

The electronics supports STM, AFM and SNOM heads, performs different kinds of spectroscopy and can acquire several user-defined auxiliary channels.

Acquisition software

Software runs under Windows and is composed of a multi- window application to control the instrument and do the data acquisition. The software controls all the parameters of the instrument.

Tools & Accessories

TriA SNOM can be equipped with a large number of laser sources and filters

*** Please contact your local distributor for specific configuration.**

Characteristics and technical specifications are subject to change without notice

V1012

A.P.E. Research s.r.l.
Area Science Park
s.s. 14, Km 163,5 Basovizza
34149 Trieste, Italy

Tel. +39.040.3757905
Fax +39.040.3757906
infos@aperesearch.com
www.aperesearch.com