



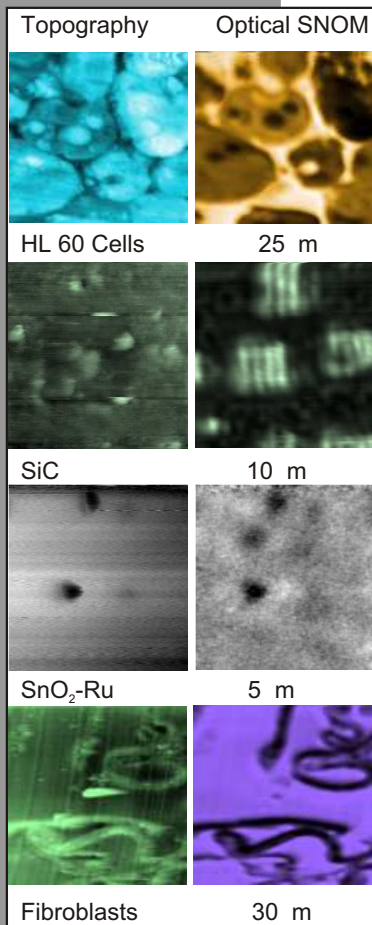
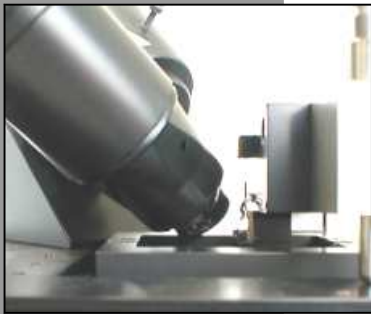
Aperture SNOM Microscope

The invention and subsequent development of scanning probe microscopy (SPM) methods have produced the necessary tools for a step forward in optical measurements.

The possibility to go beyond the Abbe diffraction limit has been achieved with the Near-field light optical microscopes (SNOM). They employ SPMs precision of piezoelectric raster-scanning together with sharp probes to obtain light optical images at rather better than the usual wavelength-limited resolution. Particular care has to be taken in the fact that the application of this physical principle to different particular problems

in solid state or biological applications leads to very different technical solutions from a technological point of view. This is the reason why a universal SNOM instrument, does not exist but each one must be tailored with a clear vision of what is going to be the main problem of interest.

For this reason our company collaborates with our customers in order to give them an instrument which could be as much as possible tuned to their needs. This project is the result of a collaboration between A.P.E. Research and the INFM, the Italian National Institute for the Physics of Matter.



Characteristics

- Aperture mode SNOM in emission/collection mode.
- Transmission (for transparent samples) and reflection configurations are possible.
- Light detection by photomultiplier in either mode is obtained via optical elements.
- Fibers: Commercially available "Tapered" sensors with 50 nm hole (nominal value) Typical emission is 1 nW. Sensors come already mounted on A.P.E. Research sample holder.
- Near field laser: external source on laboratory table.
- Maximum scan area: 85 μ m x 85 μ m.
- Maximum surface area: 9 cm². Thickness up to 8 mm.
- Macroscopic translator range: 13 x 13 x 13 mm. Manual X-Y movement, servo-assisted Z movement with 100 nm minimum step.
- Lateral resolution: better than 50 nm, reaching the theoretical limit for the aperture instruments.
- SPM Control System 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. The electronics supports STM, AFM and SNOM heads, performs different kinds of spectroscopy and can acquire several user-defined auxiliary channels.
- Software runs under Windows and is composed of multi-window applications to control the instrument and perform the data acquisition. The software controls all the parameters of the instrument.

Key features:

- Ease of Use
- Versatility
- Easily interchangeable Samples
- Easy switching between acquisition modes
- Lateral Resolution better than 50 nm

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