## GEMAC Groupe d'Étude de la Matière Condensée

## ATOMIC FORCE MICROSCOPY (AFM)

GEMaC has a Bruker Dimension ICON® atomic force microscope, equipped with automatic imaging opticmisation (ScanAsyst ®) in PeakForce tapping mode.

Atomic Force Microscopy is based on the detection of the interactions forces between a probe and a surface of conducting or instulating sample or insulator. The lateral and vertical displacement of the tip above the sample is driven by a piezoelectric tube allowing to characterise the sample surface (roughness) as well as metrologic measurements at the nanometer scale.

3 modes are available: contact mode, tapping and peakForce.

Measurements of the distribution of thelectrical and magnetical gradients (EFM and MFM) are possible, as well as an electrical characterisation (C-AFM module) on samples that are weakly conducting (current range 2 pA to 1  $\mu$ A).

Manipulation of nano-objects (indentation, local anodic oxidation, etc.) is facilitated by teh Nanolithography software. Measurements can be realised in air or in liquid media. A

mapping of the nanomechanical properties is allowed by the QNM® (quantitative nanomechanical mapping) software, on a large variety of samples (range from 1 MPa to 50 GPa for the Young modulus, and 10 pN to 10  $\mu$ N for adhesive forces).



The AFM is open to all GEMaC and ILV research teams. Prestations for external laboratories and companies are possible.