

## Atomic Force Microscope

**Make:** NT-MDT

**Model:** NTEGRA

**Purpose:** Topographic imaging, Roughness analysis, Magnetic Force microscopic imaging, Scanning Tunnelling Microscope.

This instrument is used for

- Imaging of flat surfaces (conducting and non-conducting)
- Surface roughness analysis.

Imaging using Contact, non-contact, semi-contact mode analysis

- STM, AFM, MFM, CFM etc

### **Working Principle:**

Scanning Tunnelling or Atomic force microscope (STM/AFM) enables to acquire images showing the arrangement of individual atoms in a sample. An AFM physically 'feels' the sample's surface with a sharp probe, building up a map of the height of the sample's surface. This is very different from an imaging microscope, which measures a two-dimensional projection of a sample's surface.

A standard AFM system consists three important basic components: a piezoelectric transducers, a force transducers / force sensors, and a feedback control. The piezoelectric transducer moves the tip over the sample surface, the force transducer senses the force between the tip and the surface, and the feedback control feeds the signal from the force transducer back in to the piezoelectric, to maintain a fixed force between the tip and the sample. AFM has various 'spectroscopic' modes that measure other properties of the sample at the nanometre scale.

### **Major Applications**

Materials science

Chemistry

Biology

Physics

Nanotechnology

