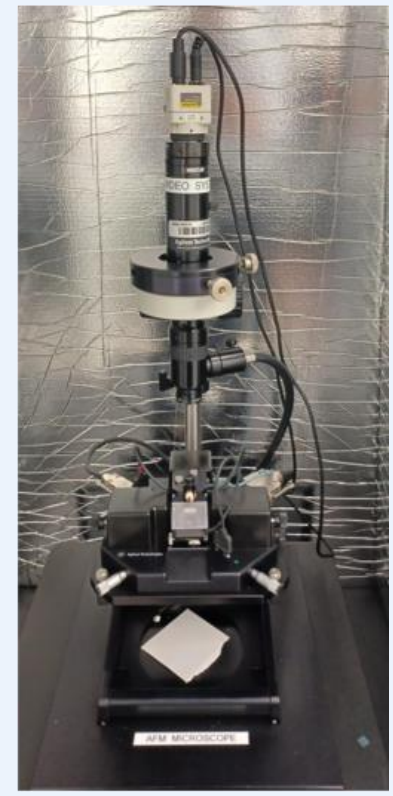
Advanced Makerspaces for PiLot production by micro-Enterprises

Atomic Force Microscpe

Surface imaging at the nanoscale

Introduction

The Atomic Force Microscope (AFM) is a high-resolution surface imaging tool capable of mapping material surfaces at the nanometer scale. Unlike electron microscopy techniques, AFM works without the need for a vacuum, making it suitable for a wide range of materials, including polymers, biological samples, and thin films.



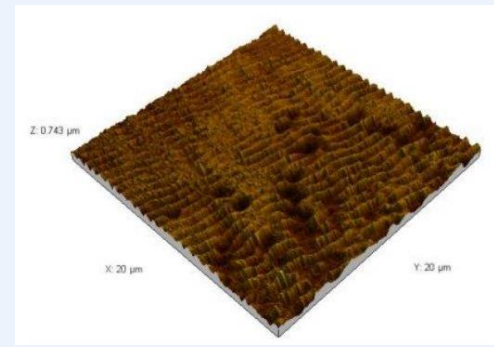
Agilent 5500 AFM

Applications

- Surface Characterization: High-resolution imaging of surface topography.
- Nanoindentation: Nano-indentation and mechanical property analysis.
- Material Research: Study of nanostructures, thin films, and surface features.

How Does it Work?

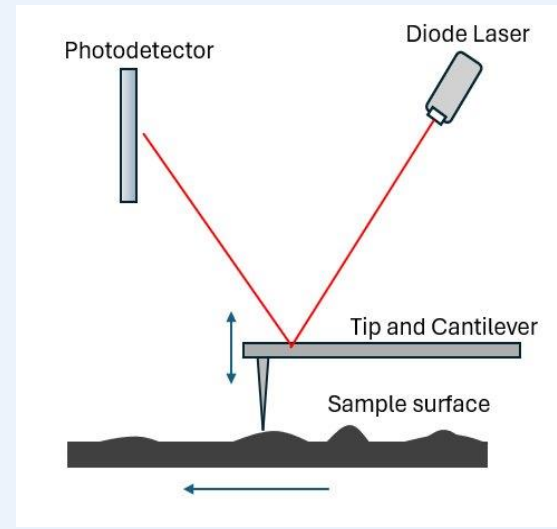
AFM operates by bringing a sharp probe mounted on a flexible cantilever extremely close to the sample surface. Attractive and repulsive interatomic forces, such as van der Waals forces, cause the cantilever to bend as the tip scans across the surface. This deflection is precisely measured and processed to generate a high-resolution topographical image of the surface.



LIPSS on Polymer

Technical Specifications

- Various operating modes: contact mode, Acoustic A/C, and more.
- Sample size: 50x50x20mm
- Scan Range: 90x90x7µm, 9x9x2µm
- Resolution: XY ~ 1-10 nm, Z ~ 0.01 nm
- Optical microscope with 2-micron resolution.



Cantilever Diagram

Interreg
Co-funded by the European Union
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AMPLE
Ollscoil na Gaillimhe
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