

## USE OF THE ATOMIC FORCE MICROSCOPE

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### OBJECT

To observe the different imaging modes available with the AFM and to obtain topographical and physical information about a variety of samples. Your write up should be brief and explain the imaging modes and data obtained. You should take along one or more of your own specimens for study. Note that a scan area of  $50\mu\text{m} \times 50\mu\text{m}$  is a large scan in the AFM. Samples must be well polished, or with very low relief.

### EXPERIMENTAL

#### *Imaging modes*

##### Contact Mode AFM.

From a polished sample:

1. Examine the surface with an optical microscope.
2. Examine the surface in the AFM-Contact mode - at different magnifications (including the ones you used in 1, if possible).
3. Obtain a micrograph of the fracture surface from which to extract surface topography and roughness measures.

##### Tapping Mode AFM.

From a polished two-phase sample.

4. Obtain a tapping mode image and associated phase image.

##### Magnetic Force Mode AFM.

From a smooth or polished magnetic sample.

5. Obtain matched topographic and magnetic images of the sample.

In your write up, be sure to explain the various imaging modes, similarities among them and potential sources of confusion in image interpretation.

N.B. Although the lab will be performed in groups, write -ups should be **individual** efforts.