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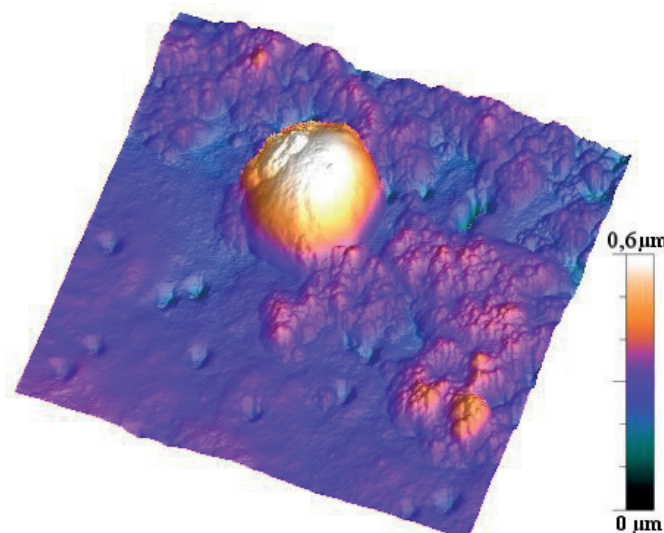
CBM - UPR4301
Center for Molecular Biophysics

AFM/RAMAN FACILITY

Atomic force microscopy (AFM) and Raman spectroscopy are non-destructive techniques for small-scale imaging and characterization in liquid or in air.

Raman spectroscopy identifies micrometric sized phases using the vibration of its atomic bonds induced by a laser beam. This technique is particularly adapted for mineralogy, materials science and biology. Compositional maps from few microns to up to 10x15 cm² can be made with the instrument we have at the CBM. Three-dimensional compositional maps can be acquired using the confocality of the system.

AFM maps parameters, such as topography, adhesion, hardness, etc at very small scales by scanning the surface of a sample using a very sharp tip. The AFM instruments at the CBM can image nanometric objects on surfaces smaller than 200x200 µm² and smaller than 20 µm vertically. The vertical accuracy is below Angström level. This technique does not require any particular surface preparation. It can be used in several domains, such as biology and materials science.



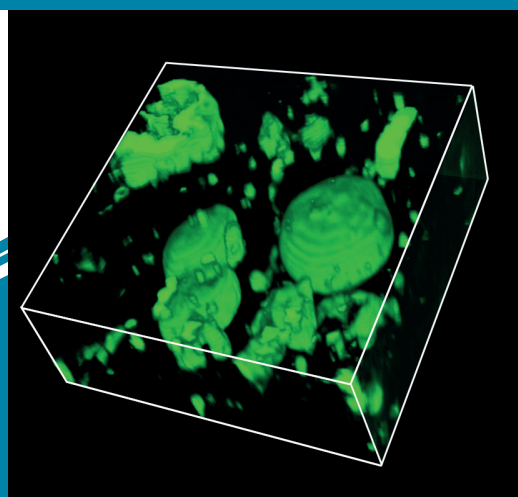
AFM image of an artificially-fossilised bacteria (3.5x3.5 µm²)

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3D image of the distribution of carbon in an 800 million years old fossilised microorganism (50x50x20 µm³)



Experimental facilities

The AFM/Raman platform is composed of 2 main instruments:

- 1 confocal Raman spectrometer interfaced with an atomic force microscope (AFM), WITec Alpha 500 RA, and an AFM Veeco Dimension 3100,
- 1 optical microscope Olympus BX-51 is also available.

Keywords: raman spectroscopy, compositional map, atomic force microscopy, surface imaging, submicrometric imagery, bio-geosciences.