

KAWAKATSU LAB.

[Coupling to the nano regime]

Centre for International Research on MicroNano Mechatronics

<http://web.me.com/hkawakatsu>

Applied Scientific Instruments

Precision
engineering
department

Coupling to Nano

Touching the untouched, and seeing new landscapes of familiar objects

Detection of the vibration of small objects tell us about their mass and the field in which they are placed. Atomic Force Microscopy is one example. We are investigating various detection and control methods of vibration of micro to molecular level objects, with the main objective of implementing novel microscopy.

- ◆ Liquid AFM – Succeeded in imaging ice-like structureing at room temperature
- ◆ High frequency, low amplitude AFM: Imaging with 10 pm amplitude and 3D force mapping
- ◆ FIM/Atom Probe : Towards measurement of vibration of nanocantilevers
- ◆ Towards chemical characterization of atoms by multi-modal AFM

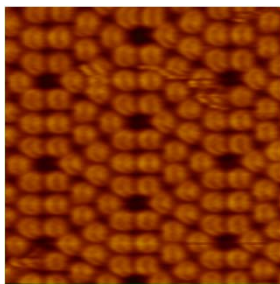


Fig.1 Imaging Si with 10 pm amplitudes

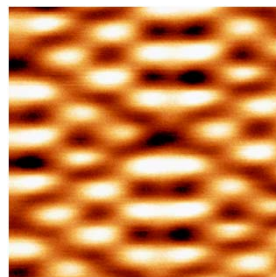


Fig.2 Direct detection of lateral force gradient

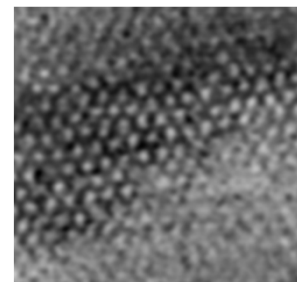


Fig. 3 Structured liquid molecules at RT.



Fig.4 UHV AFM/TEM

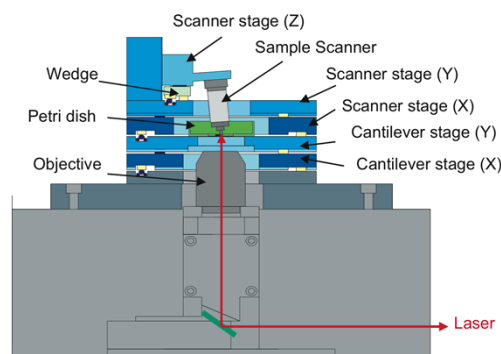


Fig.5. Liquid AFM

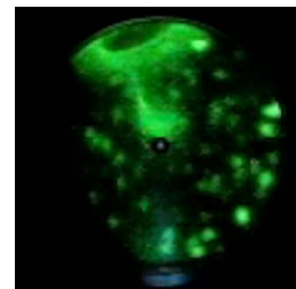


Fig.6 Towards vibration measurement of molecules and nanooscillators