

# KAWAKATSU LAB.

## [Coupling to the nano regime]

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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 structuring 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

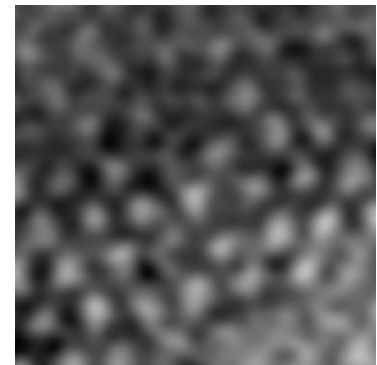
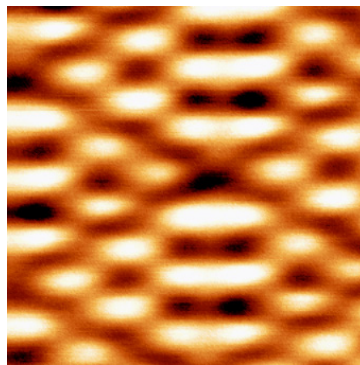
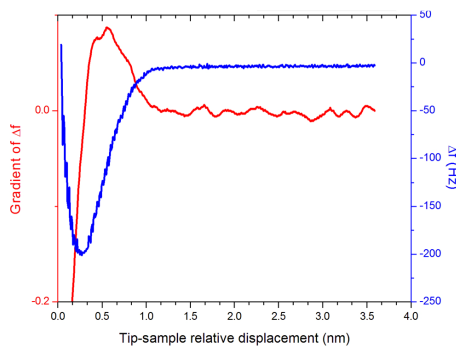


Fig.1 Simultaneous gradient measurement Fig.2 Direct detection of lateral force gradient Fig. 3 Structured liquid molecules at RT.

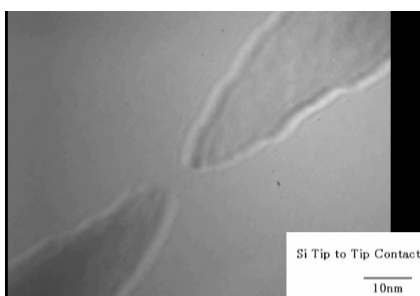


Fig.4 UHV AFM/TEM. Force curves were readily measured.

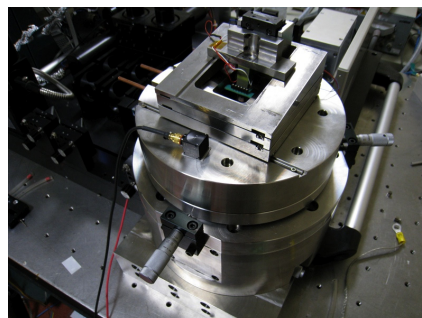


Fig.5. Variable temperature Liquid AFM

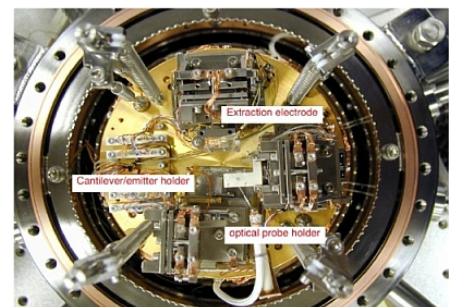


Fig.6 FIM/AFM for measurement of molecules and nanooscillators