hpAFM

High Performance AFM

System Parameters

Scanner

- XY Scan Range Options: 10µm / 100µm with 24 Bit Resolution
- Z Scan Range Options: 5µm / 15µm with 24 Bit Resolution
- 0.01nm resolution
- XYZ Closed loop operation
- Vacuum sample holder for up to 8” wafers
- Decoupled Z scanner
- Can hold samples up to 500 gr max.

Z Motorised Stage

- 50mm range, 250nm resolution

XY Motorised Stage

- 76mm range, 50nm resolution

AFM Module

- RF modulated low noise 635nm laser
- 25 fm/√Hz (max.) noise floor
- <14nm magnetic resolution with super sharp cantilevers

Video Microscope

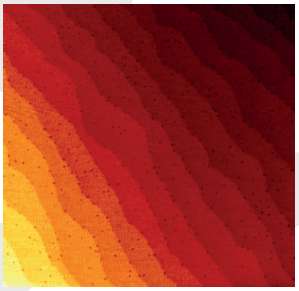
- x10 Objective, 0.28 NA, motorised focus
- 1µm optical resolution
- x1-5 motorised optical zoom
- 8MP CMOS camera
- Software adjustable white light source
- Side view camera

Acoustic and Vibration Isolation

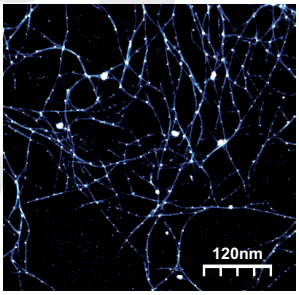
- Acoustic, thermal and vibration isolation cabinet
- Atmosphere controlled isolation cabinet (optional)
- 0.5Hz vibration isolation table in XYZ directions
- Heating and cooling between -30°C and +350°C

Standard Modes

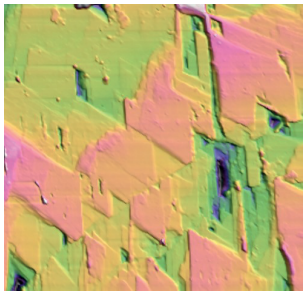
- Contact Mode AFM
- Dynamic Mode AFM
- Lateral Force Microscope
- Phase Imaging
- Magnetic Force Microscope, MFM
- F-d Curves and Spectroscopy
- Electrostatic Force Microscope, EFM
- Non-contact AFM with 5mHz Resolution Digital PLL



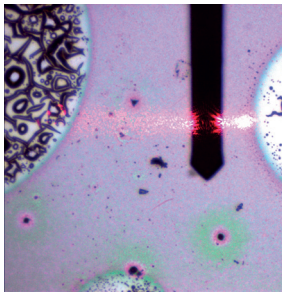
STO 3 x 3 µm



Carbon Nanotubes with polymer Image courtesy: Dr. Chris Roberts, Imperial College London



Etched Gypsum 45 x 45 µm



Cantilever under video microscope

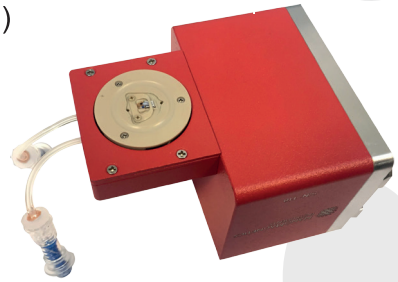
Optional Microscopy Modes

- Current Sensing AFM (Spreading Resistance AFM)
- Nanolithography
- Viscoelasticity Measurements
- Adhesion Force Imaging
- Conductive AFM
- Scanning Kelvin Probe Microscopy
- Force Modulation Microscopy, FMM
- Electrochemical AFM with Potentiostat
- Piezo Response Force Microscopy, PRFM
- Closed Liquid Cell AFM
- Nanoindentation and Scratch Testing
- Scanning Tunneling Microscopy
- Nano Mechanical Imaging, NMI
- Scripting
- Dynamic Lateral Force
- Scanning Microwave Microscope, SMM
- In plane / out of plane magnetic field (±0.5T in X, ±0.12 T in Z)
- Scanning Thermal Microscopy (SThM)

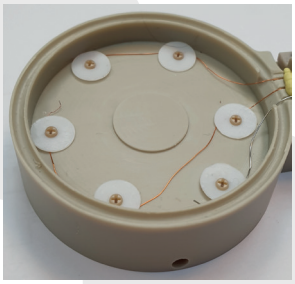
SPM Control Electronics and Software

- 3D imaging
- Image processing, analysis, and recording functions
- Simultaneous data gathering
- Up to 8192 x 8192 pixels imaging
- Automatic cantilever frequency determination
- Multi-user licence
- Lifetime free software updates
- 24 Bit Scan DAC's
- 24 Bit Z-DAC resolution
- FPGA based digital feedback
- STM and AFM feedbacks
- 24 Bit 200kHz, 16 channel ADC
- ±10V, 16 Bit bias voltage output
- 5mHz resolution digital PLL

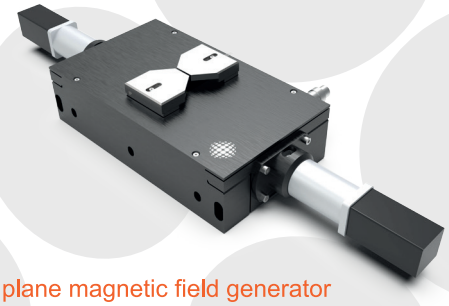
*Specifications are subject to change without notice.



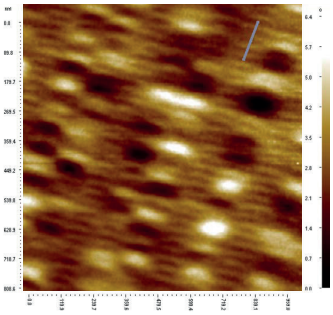
Electrochemical AFM



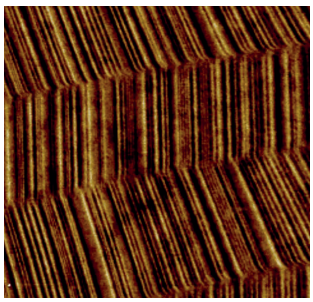
Electrochemical Cell



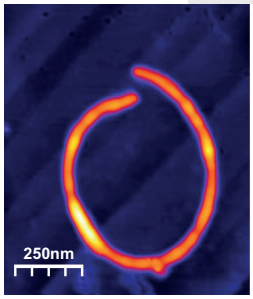
In plane magnetic field generator

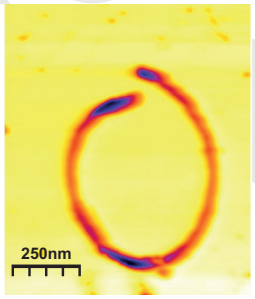


HDD

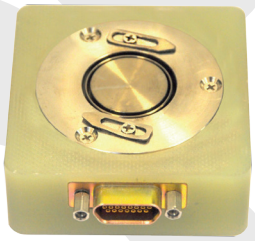


TDK Hi8 Tape 45 x 45 μm

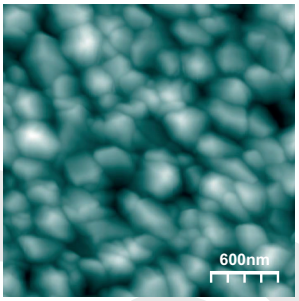




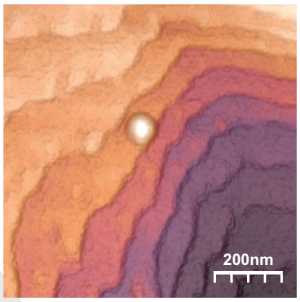
KPFM image of Multiwalled Carbon Nanotube on HOPG Left topography, right work function



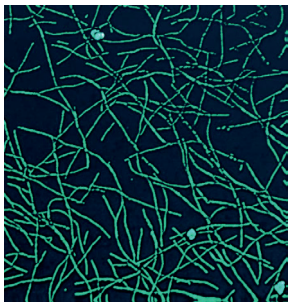
Sample Cooling and Heating Stage



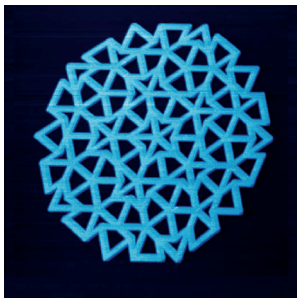
Copper coated HOPG in EC-Cell



HF Etched Mica

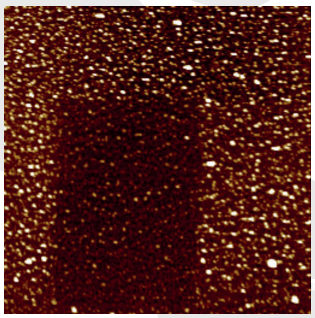


Polymer Brush 5 x 5 µm

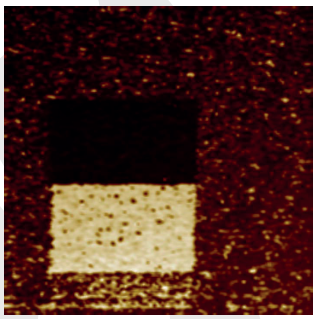


Nanomagnets 10 x 10 µm

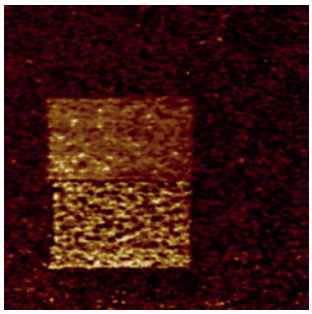
PRFM images of BCFO



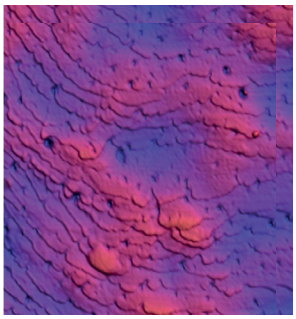
Topography of BCFO 10 x 10 µm



Phase of BCFO 10 x 10 µm

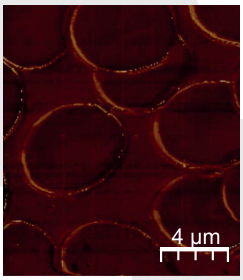


Amplitude of BCFO 10 x 10 µm

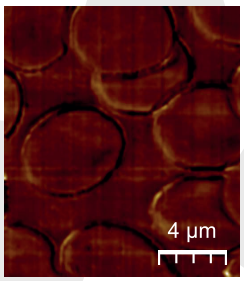


Barium Ferrite 10 x 10 µm

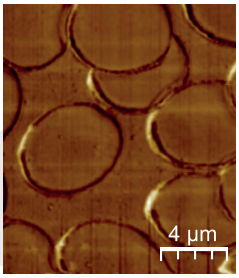
Deformation



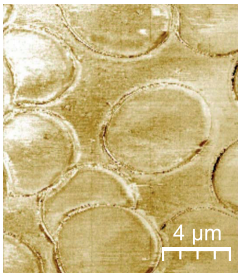
Young Modulus



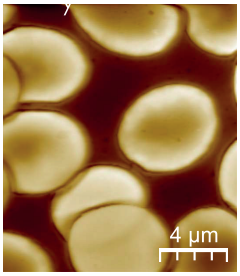
Dissipation



Adhesion

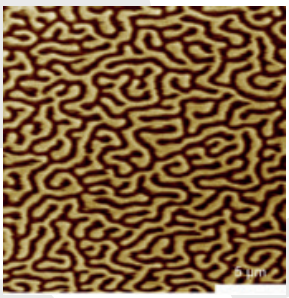


Topograph

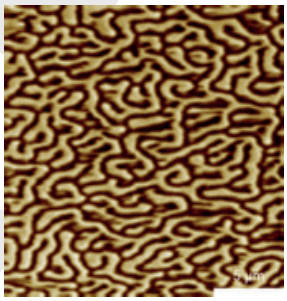


Nano Mechanical Imaging

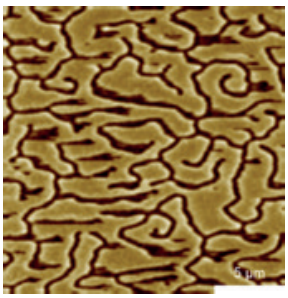
MFM Results with Vector Magnet



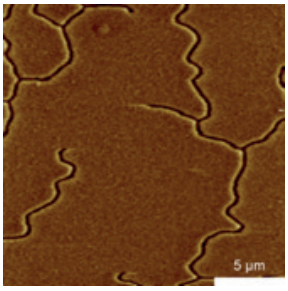
B_X: 200 Gauss
B_Z: 200 Gauss



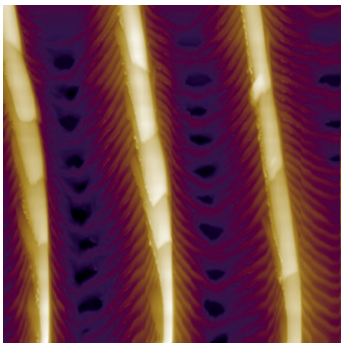
B_X: 300 Gauss
B_Z: 300 Gauss



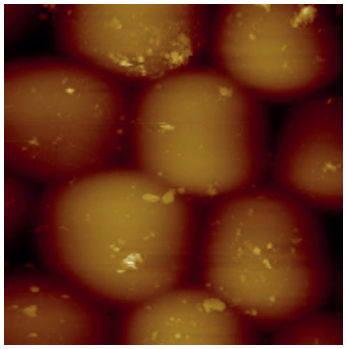
B_X: 400 Gauss
B_Z: 400 Gauss



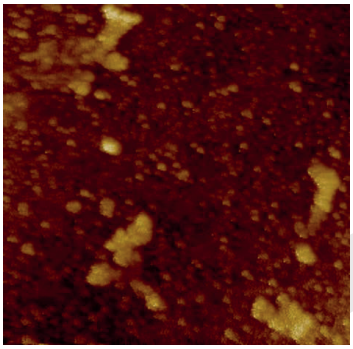
B_X: 500 Gauss
B_Z: 500 Gauss



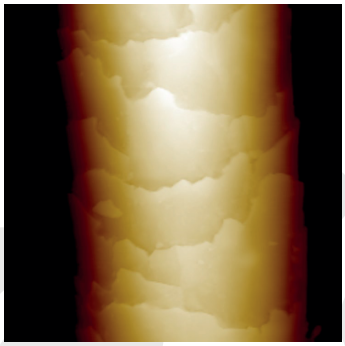
Butterfly Wing 4 x 4 µm



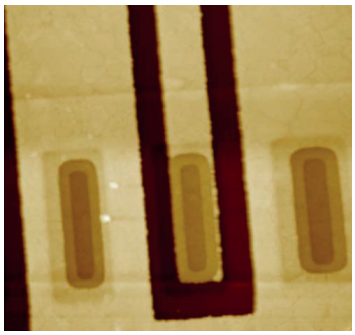
Eye of Cicada 60 x 60 µm



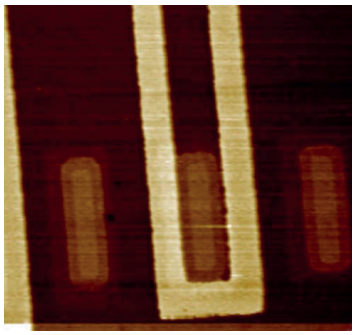
Wing of Cicada 15 x 15 µm



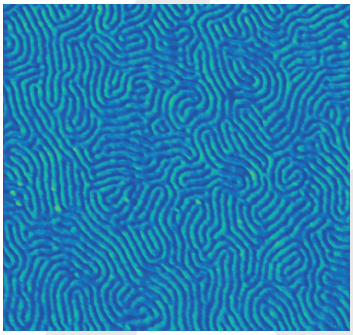
Human Hair 30 x 30 µm



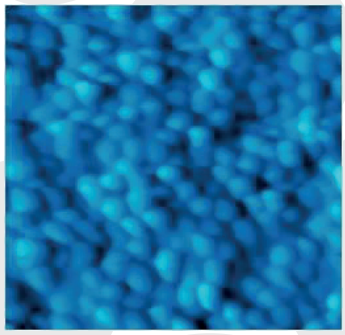
OPA 111 OpAMP, SCM 80 x 80 µm



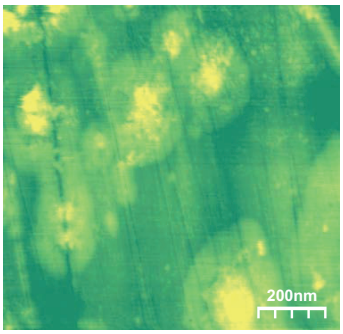
SCM Phase 80 x 80 µm



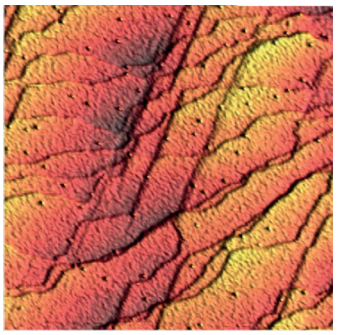
Phase Image of PS-b-PMMA Block Copolymer 2 x 2 µm



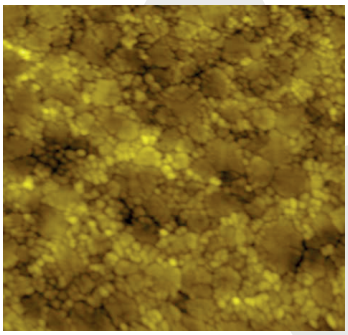
Staphylococcus Aureus (Negative) 15 x 15 µm



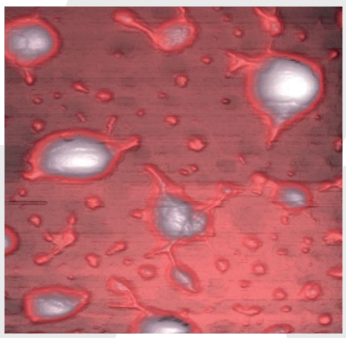
BN in PBS solution



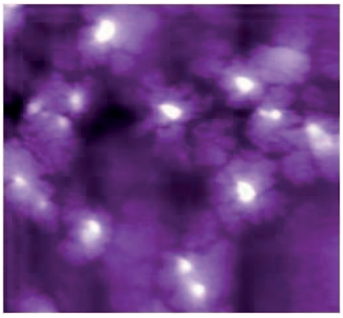
Organic Single Crystal 1 x 1 µm



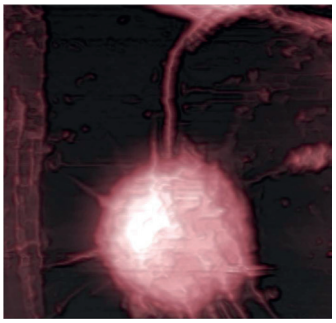
LCMO 3 x 3 µm



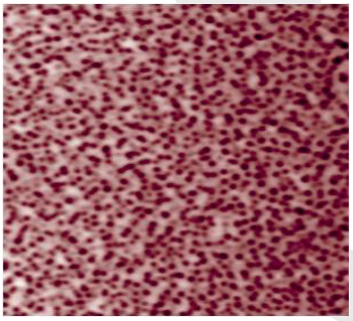
Phosphorylcolamine Coated Line 30 x 30 µm



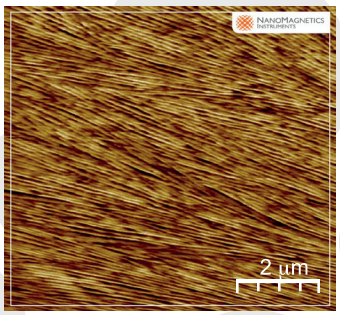
Fish Bacteria 25 x 25 µm



Cancer Cell 50 x 50 µm



$CoCl_2$ Doped Silicon-Urea 10 x 10 µm



Triblock Copolymer Phase Image