

NTEGAR AURA



High-Sensitivity Scanning Probe Microscope for Controlled Environments & Low Vacuum

Key Advantages at a Glance

- ✓ Quick vacuum startup (1 min to 10^{-3} Torr)
- ✓ Tenfold Q-factor boost improves force sensitivity
- ✓ Full AFM functionality under low vacuum
- ✓ More than 40 AFM modes supported
- ✓ Open architecture for magnetic, thermal, and electrical experiments
- ✓ Compact, easy to operate, and maintain
- ✓ High-resolution optical navigation ($1\ \mu\text{m}$)
- ✓ Built-in closed-loop feedback on all axes.



Optimized Conditions – Maximized Results

Vacuum SPM delivers superior imaging compared to ambient conditions by dramatically enhancing the cantilever's resonance (Q-factor). This results in sharper, higher-resolution images in semi-contact AFM and increased sensitivity in non-contact modes like MFM and EFM.

NTEGRA Aura overcomes typical vacuum drawbacks—bulky systems and long pump times—thanks to its compact, economical design. It reaches a tenfold Q-factor improvement in just one minute of pumping; 10^{-3} torr is typically sufficient.

Instant Environmental Feedback

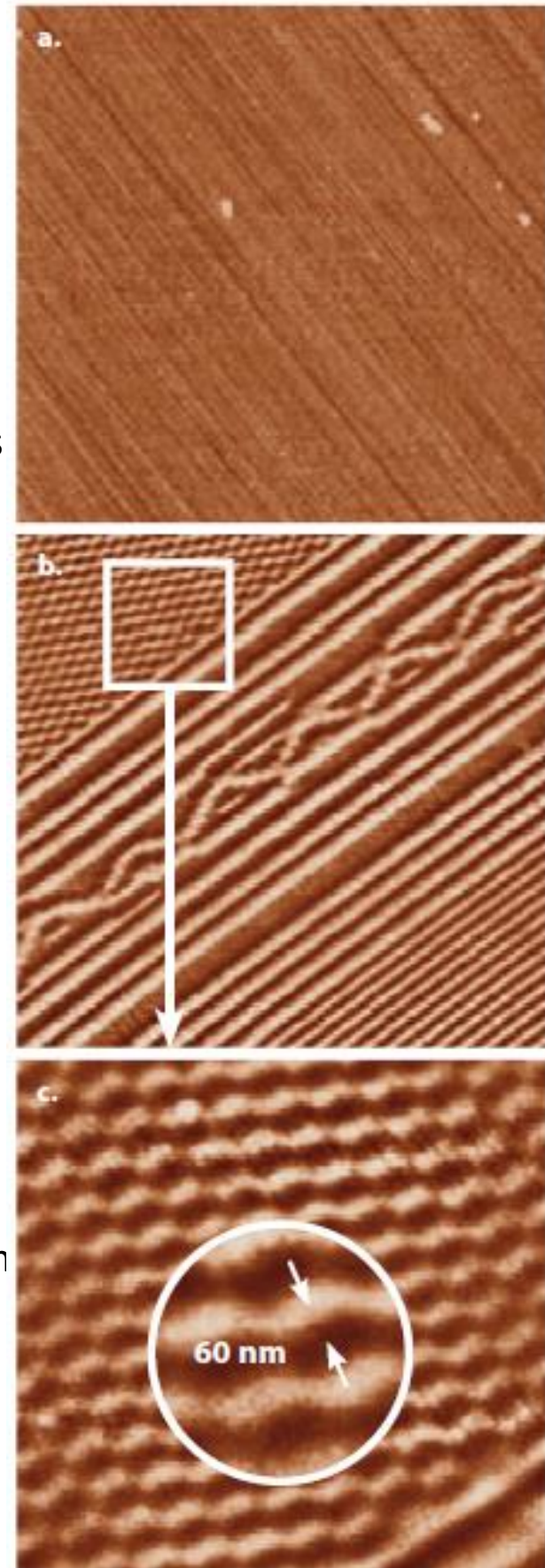
A built-in LCD and sapphire plate display real-time temperature and humidity inside the system. NT-MDT SI engineering maintains ± 0.005 °C thermal stability. The integrated optical viewing system allows easy tip targeting and documentation, aligning with AFM images.

Precision at the Nanoscale

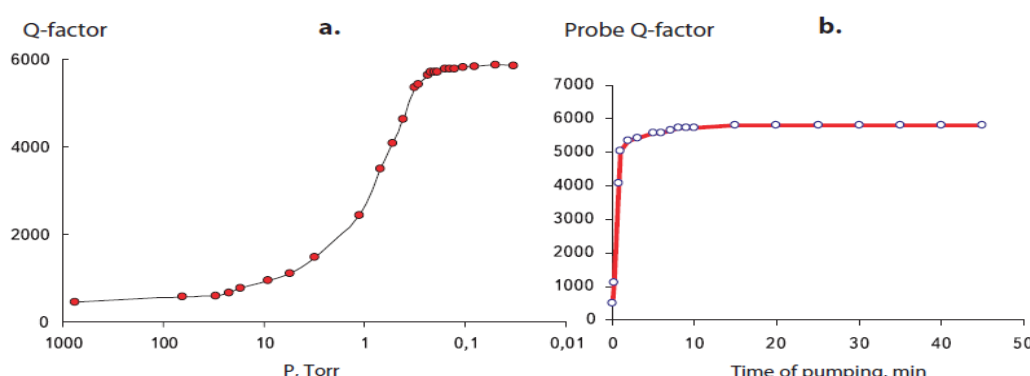
Closed-loop feedback sensors in NTEGRA Aura enable ultra-low noise, compensating for non-linearity, hysteresis, and creep. You can confidently scan areas as small as 50×50 nm—or less—with sub-nanometer accuracy.

Controlled Environment, Tunable Surface

NTEGRA Aura supports mechanical, magnetic, and electrical surface modifications using standard raster/vector nanolithography. Users can directly convert graphic templates into nanostructures using built-in algorithms—no pre-sequencing required.



HDD topography (a) and MFM images (b, c). Distance between magnetic poles of a bit is about 60 nm (white pointers on the MFM image)
Scan size a), b) 5×5 μm , c) 1.5×1.5 μm



- a) Q-Factor reaches a plateau at about 10^{-1} Torr and a higher vacuum does not increase this value substantially.
- b) It takes only 1 minute to increase the Q-factor tenfold

Scan type		Scanning by sample	Scanning by probe*
Sample size		Up to 40 mm in diameter, up to 15 mm in height	Up to 100 mm in diameter, up to 15 mm in height
Sample weight		Up to 100 g	Up to 300 g
XY sample positiniong		5x5 mm	5x5 mm
Positioning resolution		readable resolution – 5 um sensitivity – 2 um	readable resolution – 5 um sensitivity – 2 um
Scan range		100x100x10 um 3x3x2,6 um	100x100x10 um 50x50x5 um
Scan range		Up to 150x150x15 um**(DualScan™ mode)	Up to 150x150x15 um**(DualScan™ mode)
Non linearity, XY (with closed loop sensors)		≤ 0.1%	≤ 0.15%
Noise level, Z (RMS in bandwidth 1000 Hz)	With sensors	0.04 nm (typically), ≤0.06 nm	0.06 nm (typically), ≤0.07 nm
Noise level, Z (RMS in bandwidth 1000 Hz)	Without sensors	0.03 nm	0.05 nm
Noise level, XY*** (RMS in bandwidth 200 Hz)	With sensors	0.2 nm (typically), ≤0.3 nm (XY 100 um)	0.1 nm (typically), ≤0.2 nm
Noise level, XY*** (RMS in bandwidth 200 Hz)	Without sensors	0.02 nm (XY 100 um), 0.001 nm (XY 3 um)	0.01 nm
Optical viewing system	Optical resolution	1 um	3 um
Optical viewing system	Field of view	4.5-0.4 mm	2.0-0.4 mm
Optical viewing system	Continuous zoom	available	available
Temperature control	Range	From RT to +150 °C	From RT to +150 °C
Temperature control	Stability	±0.005 °C (typically), ≤±0.01 °C	±0.005 °C (typically), ≤±0.01 °C
Vacuum system	Pressure	10 ⁻² Torr	10 ⁻² Torr
Vibration isolation	Active	0.7-1000 Hz	0.7-1000 Hz
Vibration isolation	Passive	above 1 kHz	above 1 kHz

* Scanning head can be configured to serve as a stand-alone device for specimens of unlimited sizes.

** Optionally can be expanded to 200x200x20 um.

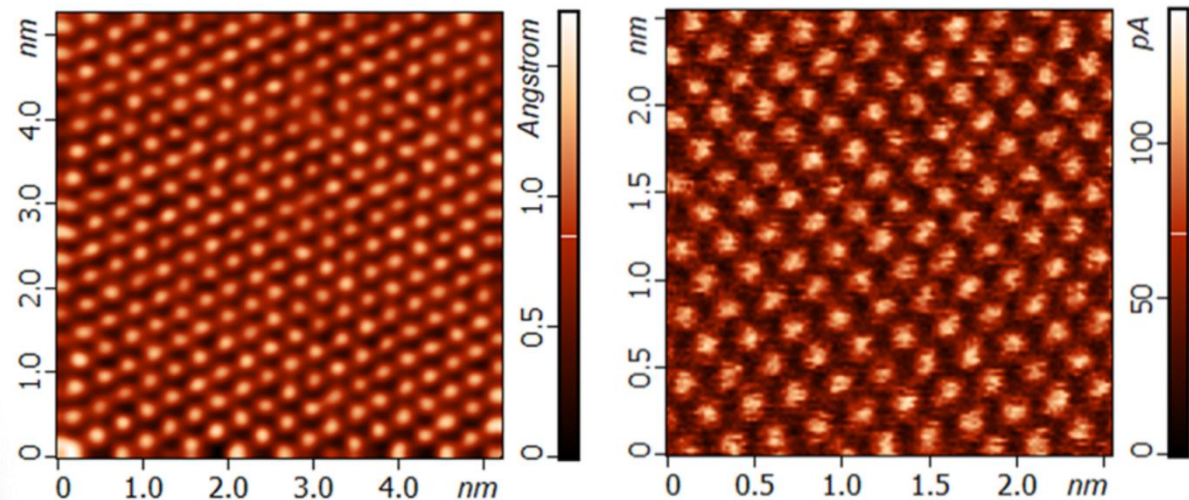
*** Built-in capacitive sensors have extremely low noise and any area down to 50x50 nm can be scanned with closed-loop control.

NTEGAR AURA



THÉLIAS TECH
SCIENTIFIC INSTRUMENTS

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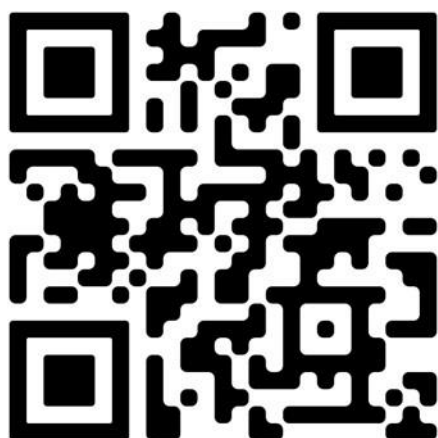


Display of the surface of a highly oriented pyrolytic graphite with atomic resolution: a. DC method, b. constant height method

Key capabilities:

- Vacuum-compatible SPM with sub-nanometer resolution
- Broad mode support: Contact, Hybrid, MFM, KPFM, PFM, STM, and more
- Expandable functionality: ± 0.3 T magnetic fields, up to 300 °C heating
- Integrated lithography and nanomechanical testing tools

NTEGRA Aura empowers your research with precision, control, and adaptability.



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