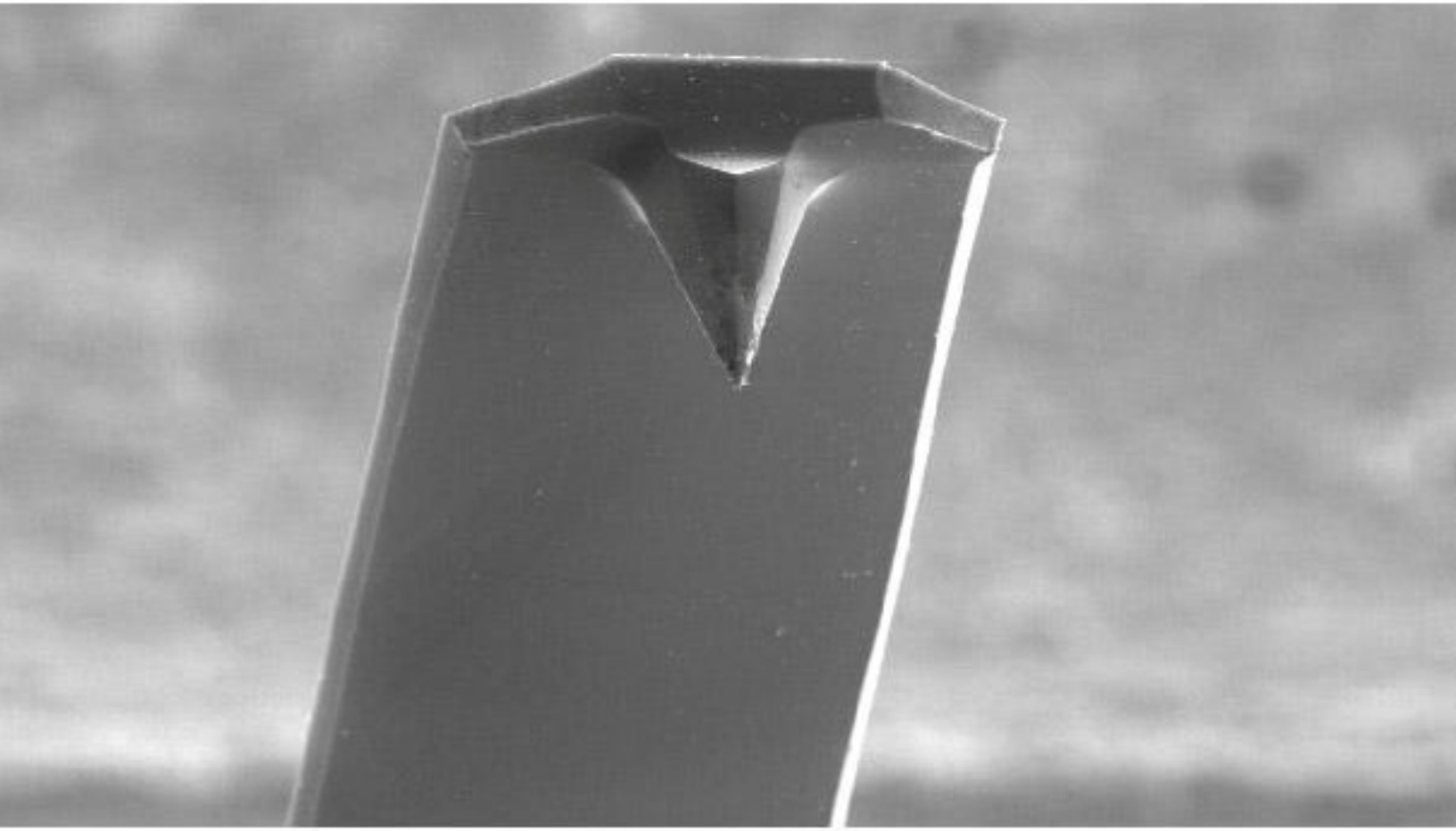
Angstrom Advanced

Atomic Force Microscopes



639 Granite St - Braintree, MA, USA - Sales@angstrom-advanced.com - +1.781.519.4765

Atomic Force Microscopy

Atomic force microscopy is a microscope technique that involves viewing samples with a resolution of under a fraction of a nanometer. The applications for Atomic Force Microscopy vary, and are widening in scope as new advances are made and time and effort is spent on new developments. Angstrom Advanced's line of Atomic Force Microscopes has consistently been ahead of the curve in terms of quality, technology, useful applications, and price. Developed in 1986 as an answer to the shortcomings of Scanning Electron Microscopes (SEM), AFM has many advantages over other microscopic viewing techniques. AFM can be used on both liquid and solid samples, in ambient environments, in small, bench top spaces. Items such as vibration isolation systems help to improve the AFM's already high measurement accuracy. Systems can be connected to simple desktop computers to read and interpret data using proprietary software that is available free with purchase of every AFM model.

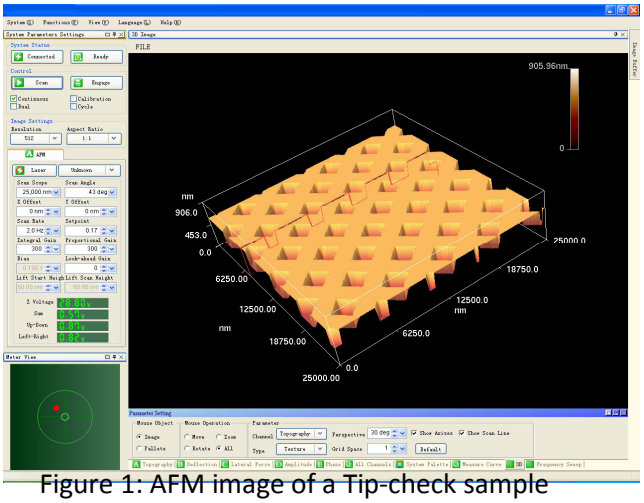


Figure 1: AFM image of a Tip-check sample

Why Choose Angstrom Advanced?

By requesting this brochure, you are taking an important first step towards making your efforts pay off. We pride ourselves in having the most sophisticated laboratory equipment in the market. In addition to this, our AFM product line is extremely flexible, being host to a wide variety of applications. Our applications range from simple high resolution sample viewing to nanolithography, MFM and EFM.

Support Staff

We offer a one-year warranty for parts and labor on all of our equipment with options for purchasing an extended warranty to ensure that your investment pays off. Our qualified technical support people are available to answer your questions via phone and e-mail so your productivity will never falter due to malfunctioning equipment. Our sales and support team is staffed with individuals who are friendly, knowledgeable, and most importantly: available to serve your needs. We take pride in offering all of these services to our clients at the most reasonable price on the market.

Technical Performance

All of our AFM models are equipped with Digital Signal Processors (DSP) to perform lightning fast calculations (4.8 million per second). All models give force analysis results and utilize multiple channel signals to give the highest resolution results. Operations such as trace/re-trace, forward/backward scan, and real-time imaging, and data import/export come standard on all models. Our models are easy to use, and can be operated by both technical and non-technical personnel. The microscope itself is integrated into one small and portable package. All models offer spacious sample compartments to accommodate a wide variety of sample sizes.

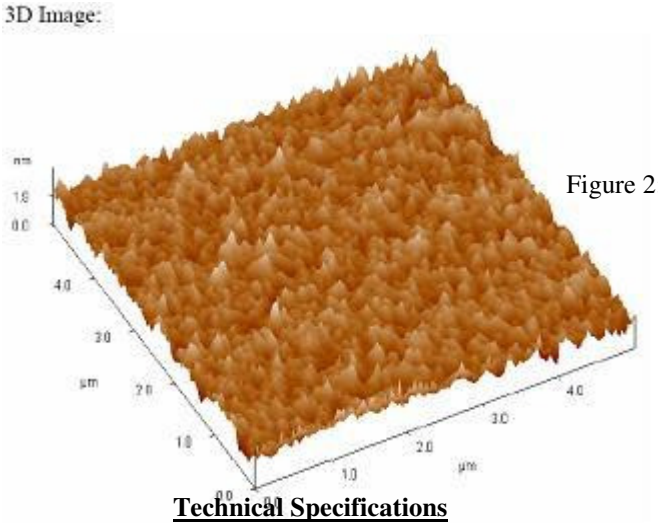


Figure 2: 3-Dimensional AFM Topography

Technical Specifications

We are confident that we have a model to fit every AFM need. If the information you need is not listed below, please contact us by phone at 781-519-4765 or by e-mail at sales@angstrom-advanced.com

AA2000

- AFM/ LFM/ STM modes
- Real-time imaging
- Automatic tip-engagement
- Fully digital operation with system status checks
- Nano-Movie Function (Contiuous data collection, storage, and replay
- Future system upgrades available

Functions	Atomic Force Microscope (AFM) Lateral Force Microscope (LFM)
Resolution	AFM: 0.26nm lateral, 0.1nm vertical
Technical Parameters	X-Y scan scope：～10μm Z distance：～2μm Image Pixels: 128X128, 256X256, 512X512, 1024X1024 Scan Angle: 0～360° Scan Rate: 0.1～100Hz
Electronics	CPU: 32-bit Digital Signal Processor (DSP) at 600MHz from Texas Instruments; Fast16-bit DAC Fast16-bit ADC High Voltage: 5 channel Communication Interface: 10M/100M Fast Ethernet
Mechanics	Sample Size: Up to 45mm in diameter, 30mm thick; Engagement: Auto engagement with travel distance of 30mm and precision of 50nm;
Software	Online Control Software and offline Image Processing Software for Windows Vista/XP/2000/9x;

Figure 3: AA-2000/3000 Model

AA3000

- AFM/ LFM/ STM modes
- Real-time imaging
- Automatic tip-engagement
- Fully digital operation with system status checks
- Nano-Movie Function (Continuous data collection, storage, and replay
- Future system upgrades available

Functions	Atomic Force Microscope (AFM) Scanning Tunneling Microscope (STM) Lateral Force Microscope (LFM)
Resolution	AFM: 0.26nm lateral, 0.1nm vertical Scanning Tunneling Microscope (STM)
Technical Parameters	X-Y scan scope：～10μm Z distance：～2μm Image Pixels: 128X128, 256X256, 512X512, 1024X1024 Scan Angle: 0～360° Scan Rate: 0.1～100Hz
Electronics	CPU: 32-bit Digital Signal Processor (DSP) at 600MHz from Texas Instruments; Fast16-bit DAC

	Fast16-bit ADC High Voltage: 5 channel Communication Interface: 10M/100M Fast Ethernet
Mechanics	Sample Size: Up to 45mm in diameter, 30mm thick; Engagement: Auto engagement with travel distance of 30mm and precision of 50nm;
Software	Online Control Software and offline Image Processing Software for Windows Vista/XP/2000/9x;

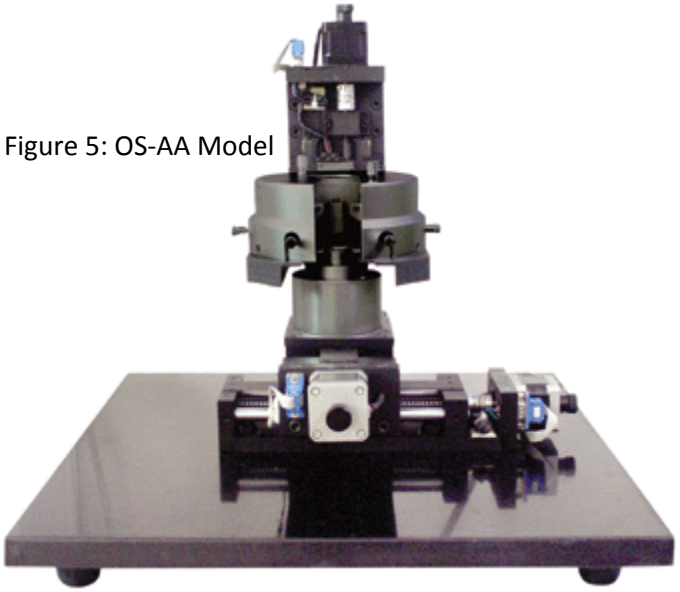
Figure 4: AA-5000 Model

AA5000

- AFM/ LFM/ STM modes
- Real-time imaging
- Automatic tip-engagement
- Fully digital operation with system status checks
- Nano-Movie Function (Contiuous data collection, storage, and replay
- Future system upgrades available

Functions	Contact Mode Tapping Mode Phase Imaging Lifting Mode; Lateral Force Microscope (LFM) Scanning Tunneling Microscope (STM) Conductive AFM, SPM in liquid, Environmental Control SPM; Nano-Processing System including Lithography Mode and Vector Scan Mode;
Resolution	AFM: 0.26nm lateral, 0.1nm vertical; STM: 0.13nm lateral, 0.01nm vertical;
Technical Parameters	Current Sensitivity: ≤10pA; Force Sensitivity: ≤5pN; Image Pixels: 128×128, 256×256, 512×512, 1024×1024, 2048×2048; Scan Angle: 0-360° adjustable; Scan Rate: 0.1-100Hz adjustable; Pre-setting Tunneling Current: 0.001-10nA Bias: -10-+10V; Temperature Sensitivity: 0.1, Humidity Sensitivity: 0.5%RH; Sample Size: Up to 50mm×50mm, 30mm thick; Engagement: Auto engagement with travel distance of 30mm and precision of 50nm Online Control Software and offline Image Processing Software for Windows Vista/XP/2000/9x
Electronics	CPU: 32-bit Digital Signal Processor (DSP) at 600MHz from Texas Instruments; DAC: 20 channels of 16-bit DAC; ADC: 20 channels of 16-bit ADC; Communication Interface: 10M/100M Fast Ethernet;

Figure 5: OS-AA Model



OS-AA

The OS-AA is our flagship model. It's wide variety of operating modes and functions make it a very popular option in the research and industrial sectors. The system has been left open for upgrades making it an attractive long-term solution. This model's nanoprocessing and nanomanipulation functions make it an excellent tool for nanotechnology research.

Functions	Contact Mode Tapping Mode Phase Imaging Lifting Mode Electron Force Microscopy (EFM) Magnetic Force Microscopy (MFM) Lateral Force Microscope (LFM) Scanning Tunneling Microscope (STM) Conductive AFM, SPM in liquid, Environmental Control SPM; Nano-Processing System including Lithography Mode and Vector Scan Mode Nano-Manipulating with Super-Media technology Analysis Options for both granularity and roughness Software created for Windows Vista/XP/NT/2000/9X Reserved input-output channel for further system extension
Resolution	AFM: 0.26nm lateral, 0.1nm vertical; STM: 0.13nm lateral, 0.01nm vertical;
Technical Parameters	Current Sensitivity: ≤10 pA; Force Sensitivity: ≤1 pN; Image Pixels: 128×128, 256×256, 512×512, 1024×1024, 2048×2048; Scan Angle: 0-360° adjustable; Scan Rate: 0.1-100Hz adjustable; Pre-setting Tunneling Current: 0.001-10nA Bias: -10-+10V; Temperature Sensitivity: 0.1, Humidity Sensitivity: 0.5%RH; Sample Size: Up to 50mm×50mm, 30mm thick; Engagement: Auto engagement with travel distance of 30mm and precision of 50nm; Online Control Software and offline Image Processing Software for Windows Vista/XP/2000/9x;
Electronics	CPU: 32-bit Digital Signal Processor (DSP) at 600MHz from Texas Instruments; DAC: 20 channels of 16-bit DAC; ADC: 20 channels of 16-bit ADC; Communication Interface: 10M/100M Fast Ethernet;

Software Packages

Angstrom Advanced provides two proprietary software to use for data analysis and for instrument control with every AFM purchase. This software utilizes a graphical user interface (GUI) to provide a powerful, easy to work with analysis program. Program highlights include:

Instrument Control

- Windows Vista/XP/NT/2000/ME/9x compatible
- Intel/AMD Computers compatible
- AFM (Contact Mode/Tapping Mode/Amplitude and Phase Imaging/Lift Mode), LFM, C-AFM, STM, MFM, EFM
- Force Curve, Amplitude Curve, Cantilever Q Curve), Phase Curve
- I/V Curve, I/Z Curve
- Surface Current Density Analyze in STMS
- Trace-Retrace Scan, Back-Forward Scan
- Online real-time 3D image
- Full digital control, auto system status recognition
- Automatically refreshes brightness and contrast
- Sample movement with a precision of 100nm
- Data import/export function
- Dual monitor compatible

Data Analysis

- Windows Vista/XP/NT/2000/ME/9x compatible
- Data import/export
- Up to 4 images synchronization
- Roughness Analysis
- User-defined 24-bit system palette
- Image filters - Average/Convolution/Gaussian/Ranking/Local Statistics/Median/Top-Hat/Rolling Ball/High-Pass/Low-Pass/Scan line Cleanness
- Non-linear Correction/Surface Fitting
- Image transformation (Cut/Rotate/Scale/Zoom In/Zoom Out)
- 3-D image analysis
- Fourier transform/Brightness and Contrast adjustment/Imager Sharpen
- Calculation and characterization (Height/Length/Angle)
- Height Analysis/Bearing Analysis/PSD Analysis/Self Correlation Analysis/Cross Correlation Analysis/Grid Analysis
- Grain Size Analysis/Surface Roughness Analysis
- Section Lines
- Edge Enhancement (Sobel/Kirsch/Laplacian/LoG/Roberts)
- Tip Estimation and Image Reconstruction
- Image Arithmetic
- Morphology
- Nano-Movie