

Inspects NanoSpace



ATOMIC FORCE MICROSCOPE

Inability of optical microscopes in imaging sizes smaller than wavelength of visible light resulted in invention of nanoscopes in the last decades. AFM is the top in the list due to its low price and multi-applications.

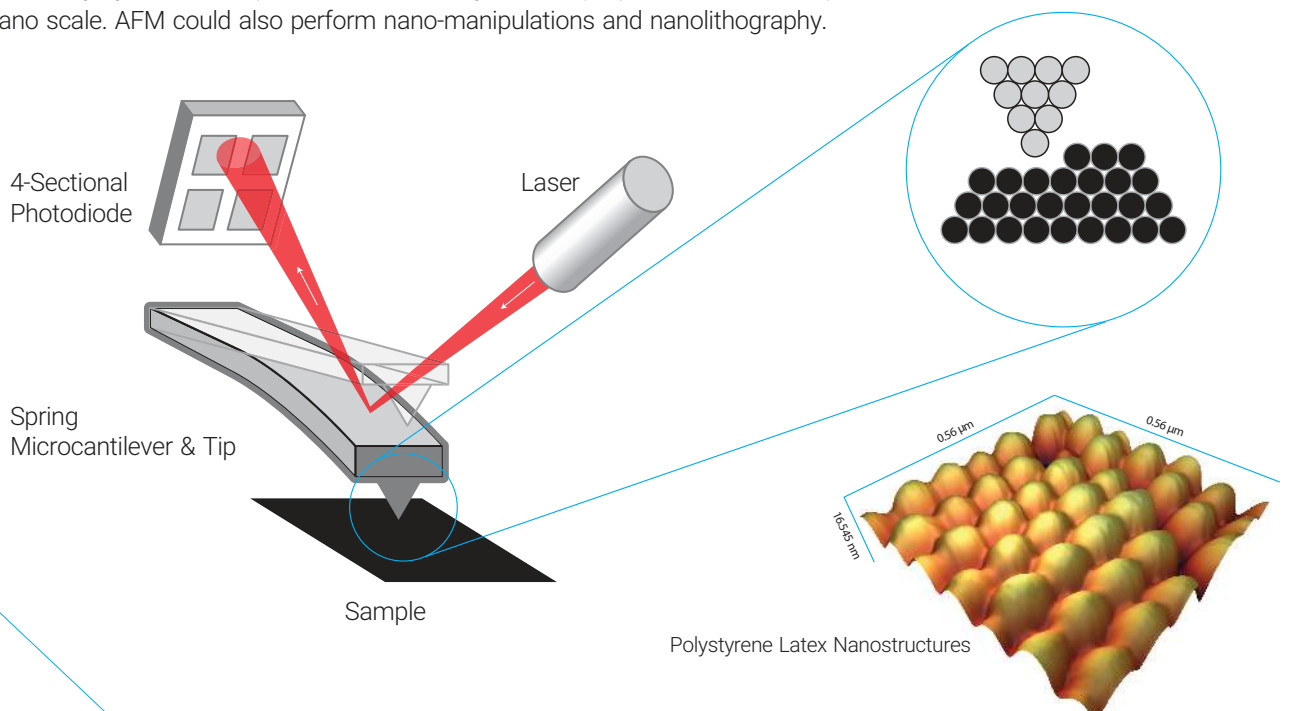
The basic principle of AFM

A spring micron size cantilever has a conical tip at its free end. The conical tip with a very sharp end, usually less than 10 nanometres, scans the sample surface from a very close nanometric distance.

As the tip moves over the surface the Van Der Waals forces between atoms on the sharp end of the tip and atoms on the surface of the sample varies, resulting vertical displacements of the cantilever.

Vertical movements of the cantilever are sensed by an optical method. The reflected laser beam from the cantilever backside hits a quadruple photodiode. The output signals of the photodiodes are related to the vertical movements of the cantilever which in turn represents the surface topography of the sample.

Nowadays AFM is the main tool in Nano research works. Apart from 3-dimensional nanoimaging, AFM is capable of determining various properties of the sample in nano scale. AFM could also perform nano-manipulations and nanolithography.



Our valuable experience in equipping over 80 universities and research centres to AFMs and our view to extend our market to all continents directed us to a new design on the technology edge.

- » Elegant and innovative appearance, modest volume.
- » Extremely user friendly; eliminating strains on users.
- » Nano imaging in least possible time duration.
- » Robustness

 Reduced Dimensions	 Fast Performance	 Quick Installation	 User Friendly
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The above features, plus using the latest technologies in manufacturing ARA-AFM, has produced an splendid apparatus for nano researchers. Ara Research, with 30 years of experience in producing nano technology equipment, today is setting forth the sophisticated functioning modes of AFM in an spectacular product.



Quality control of high-tech products



Solar cells, semiconductors and integrated circuits

Surface engineering material science



Ceramics and coatings

Polymers and chemical products



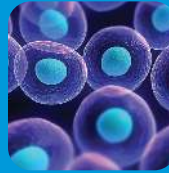
Nano-scale mechanical and electrical properties



Pathology and medicine synthesis medical science



Biotechnology research



ATOMIC FORCE MICROSCOPE



Precise
PERFORMANCE



Fast Approach
TECHNOLOGY

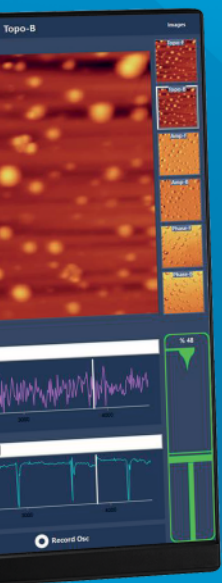


LAN INTERFACE
PLUG & PLAY



ARA RESEARCH Co.
Advanced Technology Consultants, Research and Applications

- » **Simplified procedure for nano-imaging**
Simplifications in operation together with reducing the required time for nano-imaging has made ARA-AFM extremely user friendly.
- » **Developed tip fixing procedure**
You can calmly fix the tip in AFM-head in the shortest possible time.
- » **High magnification OM**
The initial imaging for choosing the scan point is performed using a powerful OM fixed on the machine.
- » **Adopted with all computer types**
PCs, laptops, all-in-one or any other computer types can be used with ARA-AFM.
- » **New generation of the controller**
Employing the latest advanced electronics in ARA-AFM has improved the controller functioning.
- » **LAN feature**
One single network cable does all data transfer between computer and the machine.
- » **Fast Approach**
Saving time during approach by using fast approach technique is a marvellous feature of ARA-AFM.
- » **Fantastic design, compact**
ARA-AFM occupies least possible space in your laboratory and its nice looking view attracts the users.





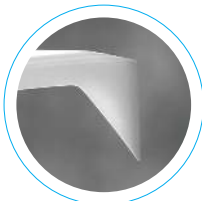
Direct online communication

Network possibility provides simultaneous connection of technical specialist and the user to ARA-AFM. This feature speeds up user's problem solving and troubleshooting. Further, one may operate ARA-AFM from any station in network and no need to be present in the lab.



Developed software

Highly-magnified tip and sample view, obtaining & auto-saving nano images and signals monitoring are unique features of the latest version of ARA-AFM software.



Straight and easy tip-fixation

Thanks to the new head design, providing the easiest way of fixing the tip without usual user's stress. Picking and putting of the tip is performed with the least possible risk of breakage.



Time saving in approach

Swift commence of scanning is due to sophisticated fast approach technique implemented in ARA-AFM.

SPECIFICATIONS

Scanner

XY scanner
 20 - 70 µm maximum XY scan range
 1 nm XY resolution

Z scanner
 4 µm maximum Z movement range
 0.1 nm Z resolution

Electronics

Plug and Play control box
 ADC and DAC channels
 4 channel ADC 24bit
 4 channel DAC 24bit

Signal processing
 40 MHz frequency zynq processor

Integrated functions
 100 MB/sec via LAN

Stage

XY stage
 Motorized software-controlled
 15 mm travel range
 40 nm movement steps

Z stage
 15 mm travel range
 40 nm movement steps
 Automatic engage of the cantilever to the Sample surface (Auto Fast Approach)

Software

Data acquisition
 Real-time 100 MB/sec microsoft windows compatible
 Integrated optical view windows for sample and cantilever vision
 Monitoring all system signals with a high rated oscilloscope
 Auto saving captured images in software gallery
 Scanning zoom-selected area on captured images
 Automatic fast approach of cantilever to the sample surface (Auto Fast Approach)

Image processing
 Independent software for image processing, data analysis and presentation
 Capability of exporting different data of images
 Built-in with all Microsoft OS

Sample Mount

20 mm maximum sample diameter
 10 mm maximum sample thickness
 Includes light magnetic sample holder
 -10 V to +10 V bias voltage range to the sample

Top View Optical Microscope

8-megapixel resolution, color
 60X to 600X optical zoom
 Integrated lighting
 Include microscope dimmer

Dedicated all in one (AIO) computer

21" Display monitor: 1920 *1080 resolution
 The latest generation of processors
 8 GB RAM

Head

High precision adjustment micrometer
 670 nm laser wavelength
 5 mW maximum laser diode power
 High grade quadruple photo-diode
 Dithering mechanism
 Optimized optical path design
 Spring lever tip holder mechanism

AFM Unit

Plug and Play

Dimension
 300 mm × 400 mm × 300 mm

Net Weight
 20 Kg

Accessories

Sample mounting kit
 The sample substrate
 Various types of cantilevers
 Tweezers and magnet box

Options

XY scanner
 Possibility to customize the XY scan range to 100 µm

Tip changing kit
 Vacuum pen

Standard Modes: Contact, Non-Contact, Tapping

Functional Kits

Fly Kit

Magnetic Force Microscopy (MFM)
 Electric Force Microscopy (EFM)
 Phase Imaging

Pro Contact Kit

Lateral Force Microscopy (LFM)
 Force spectroscopy
 Mechanical nano-lithography

Experts Kit

Chemical nano-lithography
 Force Modulation Microscopy (FMM)
 Conductive AFM (C-AFM)
 Kelvin Probe Force Microscopy (KPFM)
 Piezoresponse Force Microscopy (PFM)

- Any requirement for specific applications or modification can be customized



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