

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.

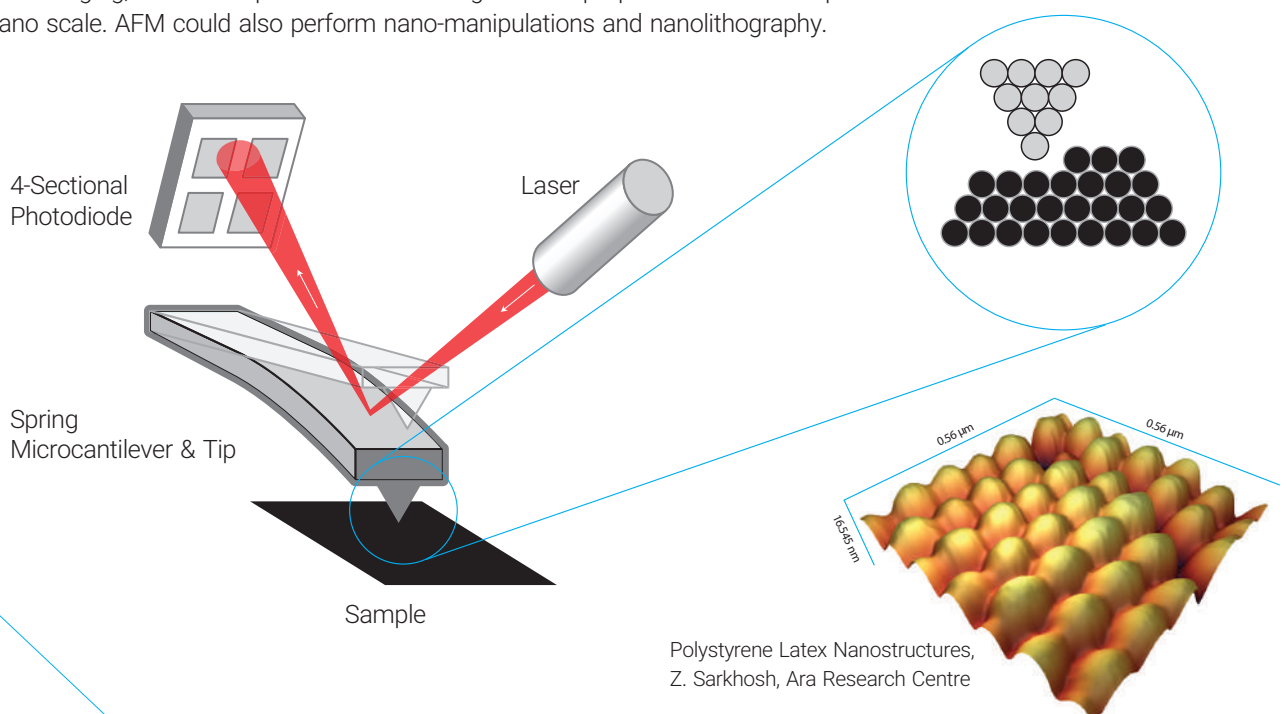
The basic principle of AFM

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 20 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



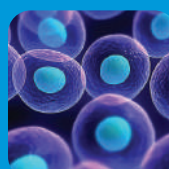
Nano-scale mechanical and electrical properties



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.

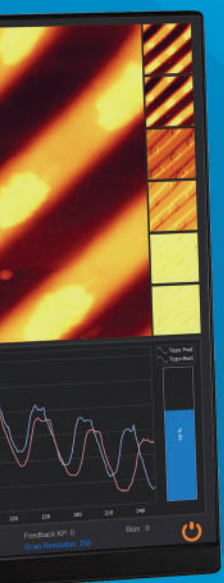
» **Adopted with all computer types**
PCs, laptops, all-in-one or any other computer types can be used with ARA-AFM.

» **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.





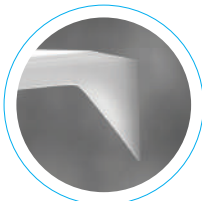
Direct online communication

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

40 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

Dedicated all in one (AIO) Computer

21" Display Monitor: 1920 *1080 Resolution

The latest generation of processors

8 GB RAM

Top Veiw Optical Microscope

8-Megapixel resolution, color

60X to 600X Optical zoom

Integrated lighting

Include microscope dimmer

Head

High precision adjustment micrometer

670 nm Laser frequency

5 mW Maximum laser diod 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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