Inspects NanoSpace

ATOMIC FORCE MICROSCOPE

ara-research.com

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.

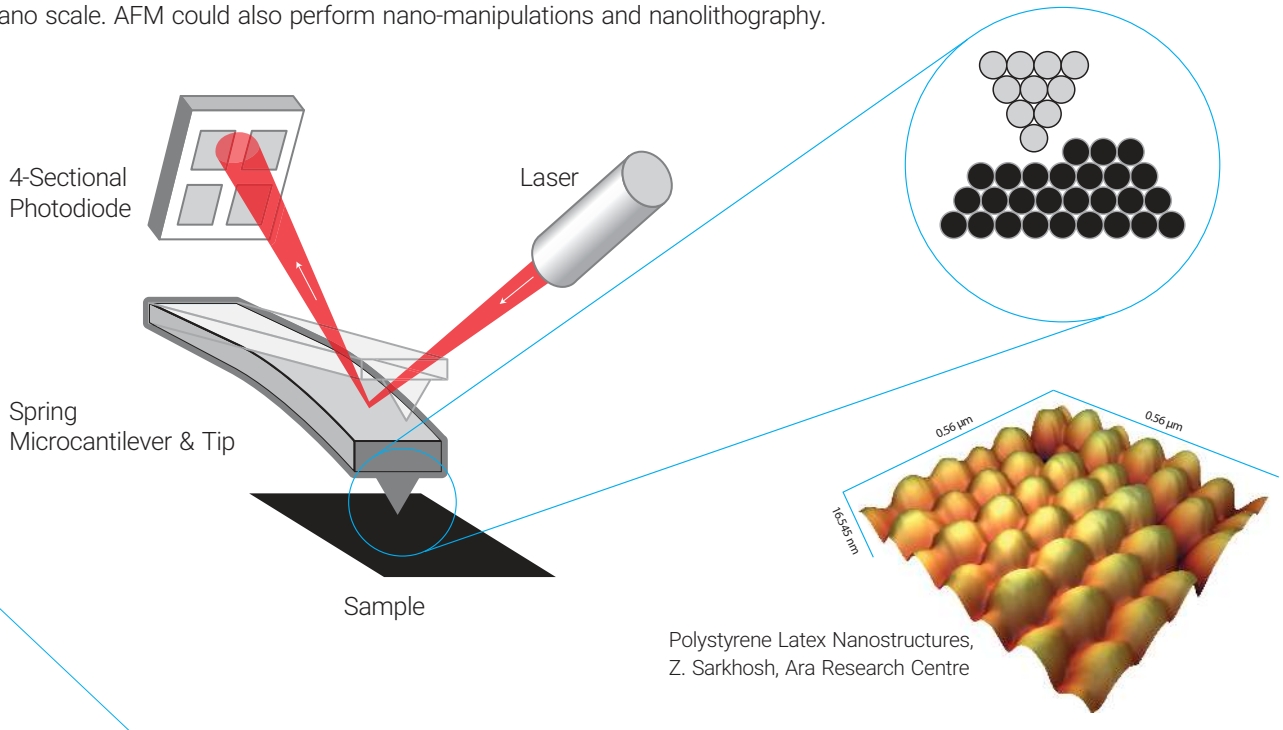
The basic principle of AFM

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.



Polystyrene Latex Nanostructures,
Z. Sarkhosh, Ara Research Centre

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

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, Researh 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.

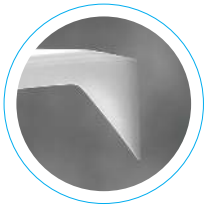
Fantastic design, compact
ARA-AFM occupies least possible space in your laboratory and its nice looking view attracts the users.

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)

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

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

Top Veiw 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 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	Pro Contact Kit	Experts Kit
Magnetic Force Microscopy (MFM)	Lateral Force Microscopy (LFM)	Chemical nano-lithography
Electric Force Microscopy (EFM)	Force spectroscopy	Force Modulation Microscopy (FMM)
Phase imaging	Mechanical nano-lithography	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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