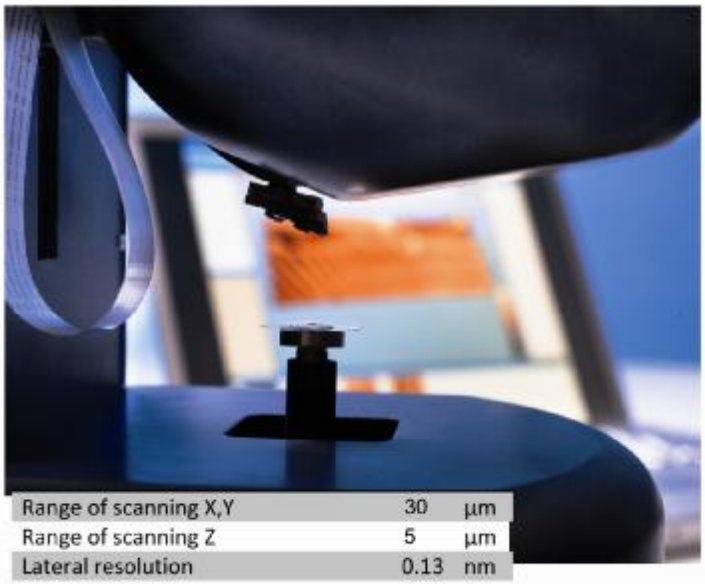

NATSYCO
SCANNING
PROBE
MICROSCOPE
(AFM / STM Modes, all in one system)
NAMA-SPM NATSYCO series has gained Worldwide popularity through its affordability, portability, and ease of use, with hundreds of systems currently in use. Now its successor, the NATSYCO, unites these three unique characteristics with a fully modular system design. whether you need a teaching tool, a training Scanning Probe Microscope, or a research instrument, what you need is what you get.
SPM (AFM/STM)
WWW.NAMASYCO.COM
Applications
- All Kind of samples
- including biological and non biological samples.
- Atomic - scale imaging solid surfaces
- Atom and nano structure manipulation
- Spectroscopy of samples at desired point
- In almost all fields of Nano technology, Optoelectronics, Surface Materials, Semiconductor and Chemistry, solid - state Physics, Biology, Medicine, etc

# Scanning Probe MICROSCOPE

Featuring aninnovational ergonomic design and improved electronics, this Scientific Microscope delivers atomic-scale resolution at a remarkably affordable price, making it an ideal choice for education as well as research. The NAMA-SPM offers educators an exceptional their students to many powerful SPM/AFM-STM techniques.



| | | |
|---|---|---|
| Range of scanning X,Y | 30 | µm |
| Range of scanning Z | 5 | µm |
| Lateral resolution | 0.13 | nm |
| Vertical resolution | 0.05 | nm |
| Scanning schema: Movable sample under stationary probe | | |
| Scanner type: Piezo ceramic | | |
| Maximum sample size | 20 | mm |
| XY Micro positioning stage | 2.5 | µm |
| Embedded video system: visualization on a PC connector via USB port from top and side. | | |
| Scanner DAC/ADC resolution | 16 | bit |

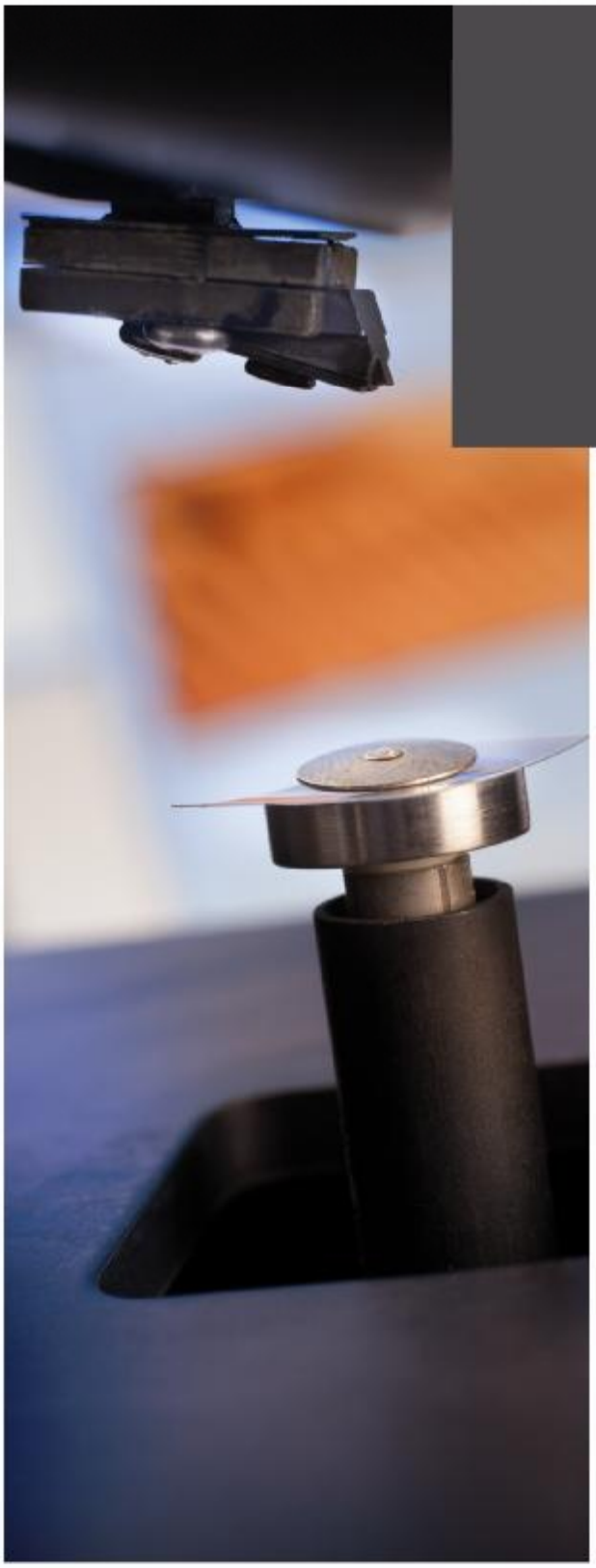

## Features

### AFM Mode:

- Contact Mode (Constant Force and Constant Height Available)
- Noncontact Mode
- Semi Contact Mode
- Force Spectroscopy
- Lithography (Chemical and Mechanical)
- LFM (Lateral Force Microscopy)
- MFM (Magnetic Force Microscopy)
- EFM (Electrostatic Force Microscopy)
- PDM (Phase Detection Microscopy)
- FMM (Force Modulation Microscopy)

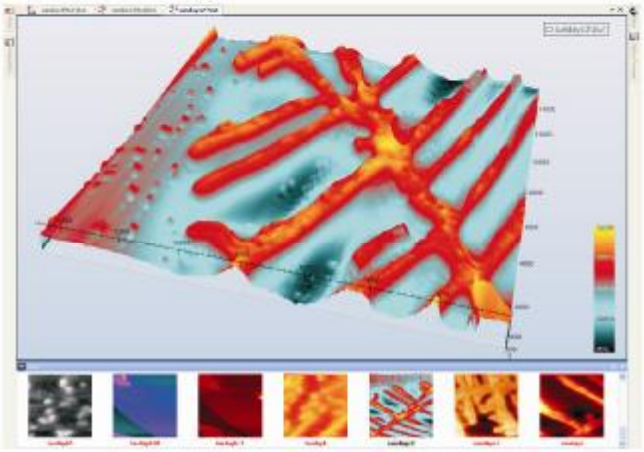
### STM Mode:

- Constant Height
- Constant Current
- Lithography
- Spectroscopy

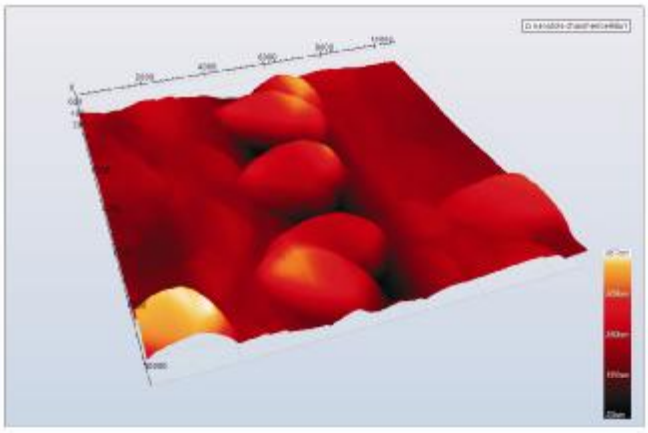


# Advantages

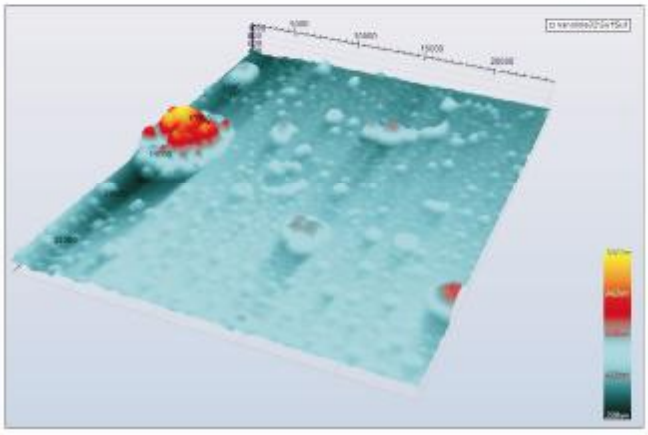
- Cost-effective platform offers simple upgrade path
- Excellent educational instrument with course curriculum



peptide scaffold



liposome and nano structure combination

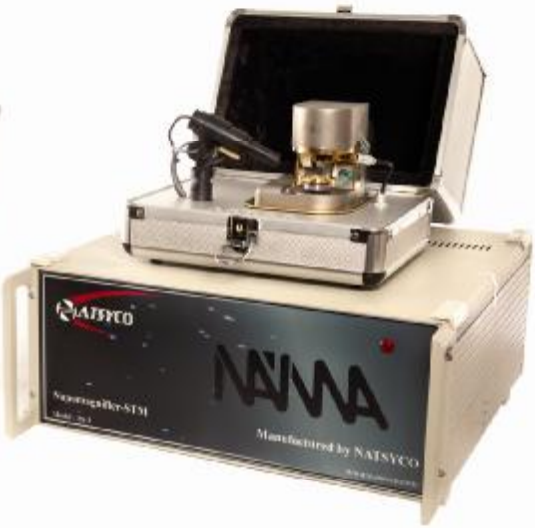


liposome and nano structure combination

# Results

# SCANNING TUNNELING

## MICROSCOPE




Features:

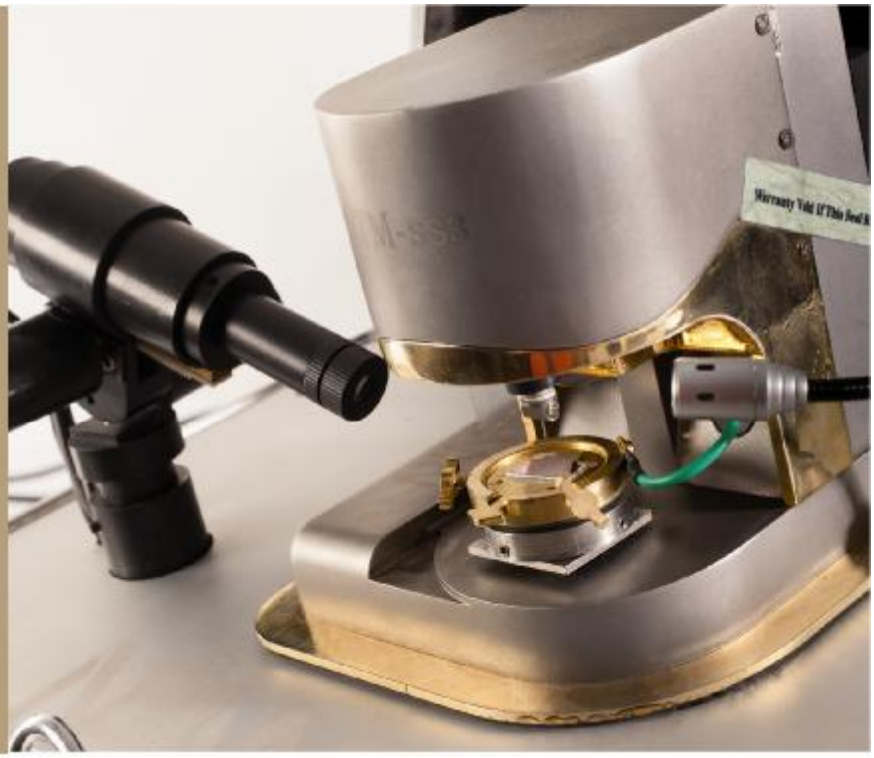
- Automatic mechanism to approach sample
- Automatic sample and camera moving by software
- Capability of spectroscopy to verify the material type with I-Z and I-V modes at desired point of surface of sample
- Engraving of nanometer-scale surface by lithography (manually or by importing the pattern images from the desired file
- Ability of tilting (adjusting X, Y axis in sample)
- Capability to change size, angle and location of image by software without handling the sample and ability of automatic offset calculation
- Ability to analyze the image independently from the scanning
- Ability to apply custom filters in three stages on the data and possibility of retrieving the data
- Capability to take the repeated imaging without user intervention and possibility of changing conditions of imaging automatically
- Ability to export result, which is compatible with other softwares (txt. file)
- Ability to storage all data of scanning with image or spectroscopy curves.
- Advanced mechanical design with very low thermal drift and the ability to view online height and current during scanning
- Imaging capability in both constant height and constant current modes with minimum electronic noise.
- Ability to change the parameters of the PID, Current and voltage during imaging
- Provide 2D and 3D images at nanometer-scale - simultaneously (such as biological molecules, DNA, Antibody and nanomaterial)
- Ability to display multiple clear and accurate 2D and 3D image files in order to compare them (for study on changing the status of polymers over the time
- Ability to measure the size of material on the image
- Hardware zoom capability for desired more detailed image.
- Software zoom capability for desired area
- Ability to customize the color of image file Specification

”

A scanning tunneling microscope is a powerful tool for obtaining micrographs from conductive and semiconductive materials. The imaging technique has recently been improved for microscopy of nanostructured biomaterials on highly ordered atomic surfaces. We describe, here, high resolution imaging of individual IgM and IgG using a scanning tunneling microscope (Nama-STM) inaircondition. The biomolecules were immobilized on the surface of Highly Ordered Pyrolytic Graphite (HOPG).Obtained micro graphs could reveal structural details of immunoglobulins G and M on the atomically flat surfaces. Obtained results confirmed that STM could be more useful than other microscopy techniques for the analysis of single biomolecules.

# Advantages

- Expandable to suite user needs
- Designed for quick and reliable measurements by experts and novices alike
- Unique price/performance ratio for research and teaching
- Mechanical stability
- Thermal drift balance
- Low electronic noise
- Ergonomic design
- Windows-based powerful software
- Easy maintenance



## STM Software

| | |
|---|---|
| Various charts of the scan data online | 2D view image, line graph, spectroscopy (I-V, I-Z) |
| Various charts of the image data offline | 2D view,3D view, line profile, color map |
| Various charts of the spectroscopy (I-V, I-Z)data offline | Line graph, first and second derivative , ... |
| Noise reduction and feature enhancement | Data filtering in three levels |
| Lithography pattern | 16 Color BMP and .dxf files |
| View all maximum scan range and change parameter very user friendly | |
| Data export | TXT,BMP,JPEG,GIF, ... |
| Automatic image transfer to offline processing software NAMA Analyzer | |

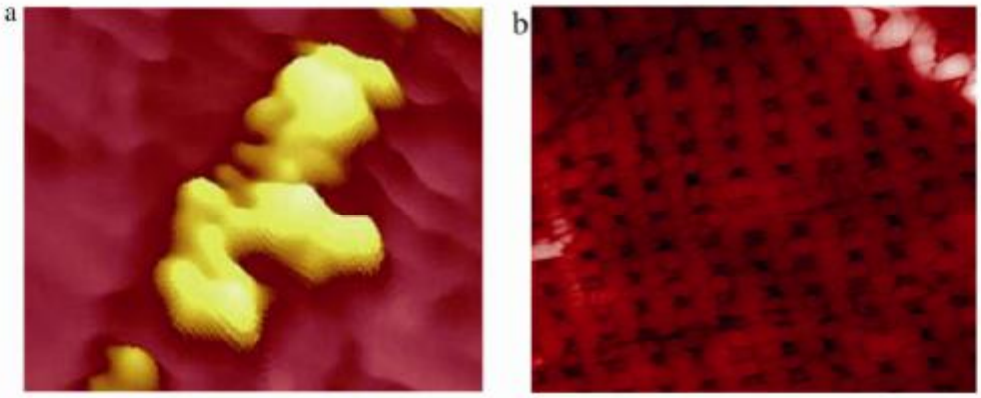
## Electronics

| | |
|---|---|
| Electronics size | 55*55*18 cm |
| Power supply | 220 V~/ 50 Hz/ 1A |
| Computer Interface | 16 bit Data Acquisition Hardware |
| Scan speed | Up to 100 Line/s at 128 data point / line |
| Scan image rotation | 0 - 360° |
| Sample tilt | Automatically by software |
| Spectroscopy modes | Single point measurement |
| Spectroscopy data point | Up to 2000 |

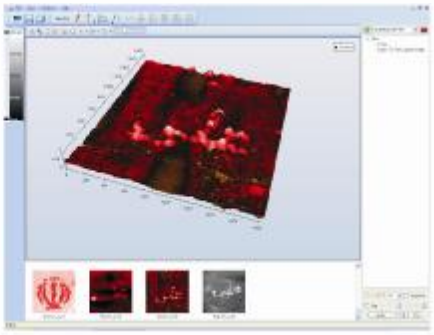
## STM Measurment

| | |
|---|---|
| Maximum scan range | 8-16 µm (±4000 nm) |
| Maximum Z-range | 3 µm (±1500 nm) |
| Derive resolution Z | 0.045 nm |
| Derive resolution XY | 0.12 nm |
| Current set point | 0.02 -100 nA in 3 pA steps |
| Imaging modes | Constant current(Topography), constant height (Current) |
| Spectroscopy modes | Current-voltage, current-distance |
| Lithography modes | Bitmap, vector and manual |
| Tip voltage | ±10 V in 0.3 mV steps |
| Sample approach | Fully automatic and manually |
| Sample size | Max 20 mm diameter |

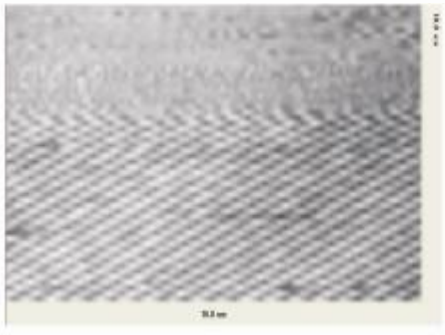
# Results




(a)3D image of a single antibody (IgG) molecule, which shows orientation of this molecule imaged by NAMA-STM, (b) Polymer surface Image using NAMA-STM at high resolution.



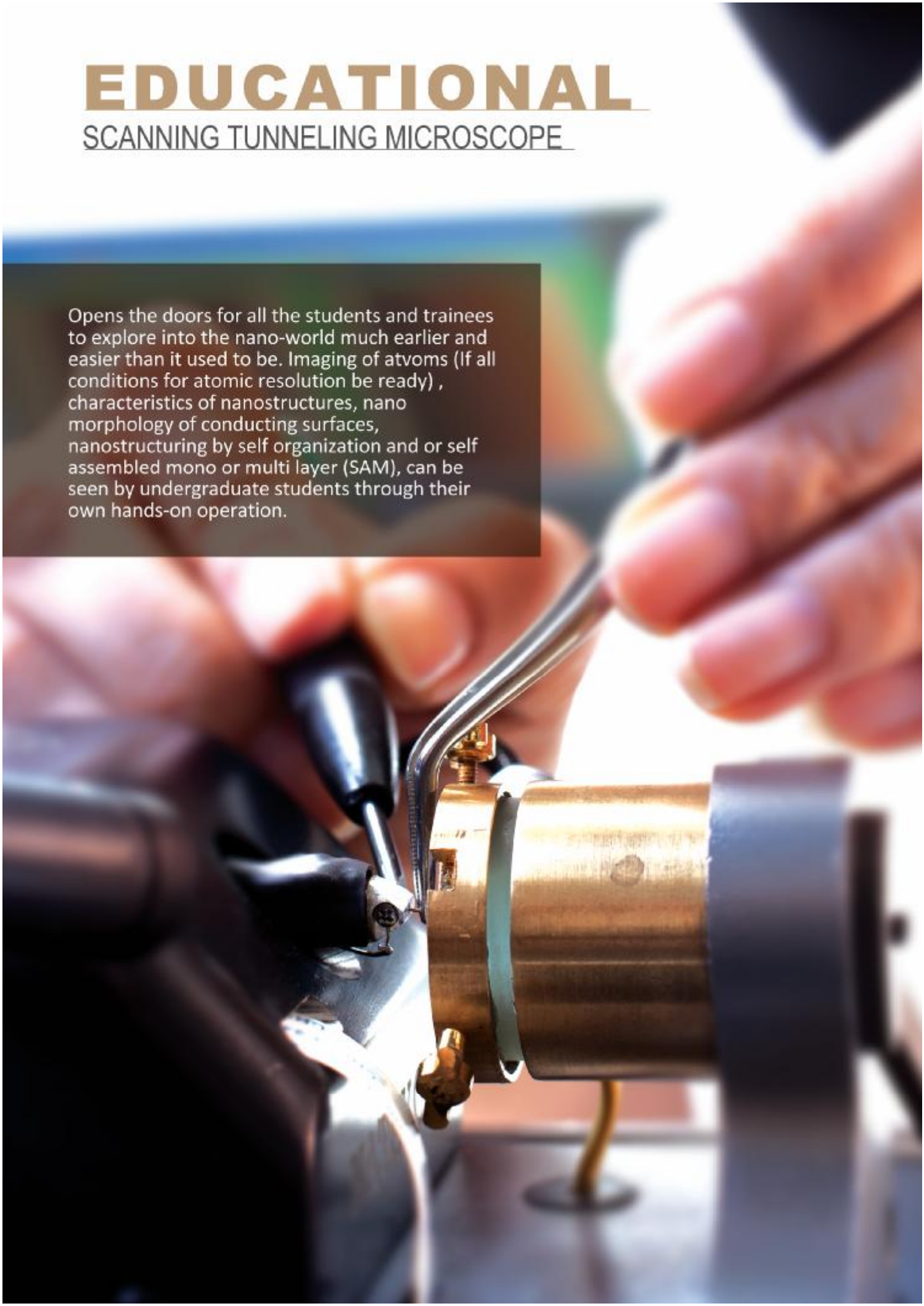
Lithography by NAMA - STM
800x1000x35 nm



Atomic resolution of HOPG
by NAMA - STM 10x10x0.15 nm

# EDUCATIONAL

## SCANNING TUNNELING MICROSCOPE



Opens the doors for all the students and trainees to explore into the nano-world much earlier and easier than it used to be. Imaging of atvoms (If all conditions for atomic resolution be ready) , characteristics of nanostructures, nano morphology of conducting surfaces, nanostructuring by self organization and or self assembled mono or multi layer (SAM), can be seen by undergraduate students through their own hands-on operation.

**Education:**
Fundamental Physics Experiment, Modern Physics Experiment and a variety of experiments in the fields of Material Sciences, and Chemistry also Quantum Mechanics, etc.

**Training:**
Ideal for training before operating a commercial STM.

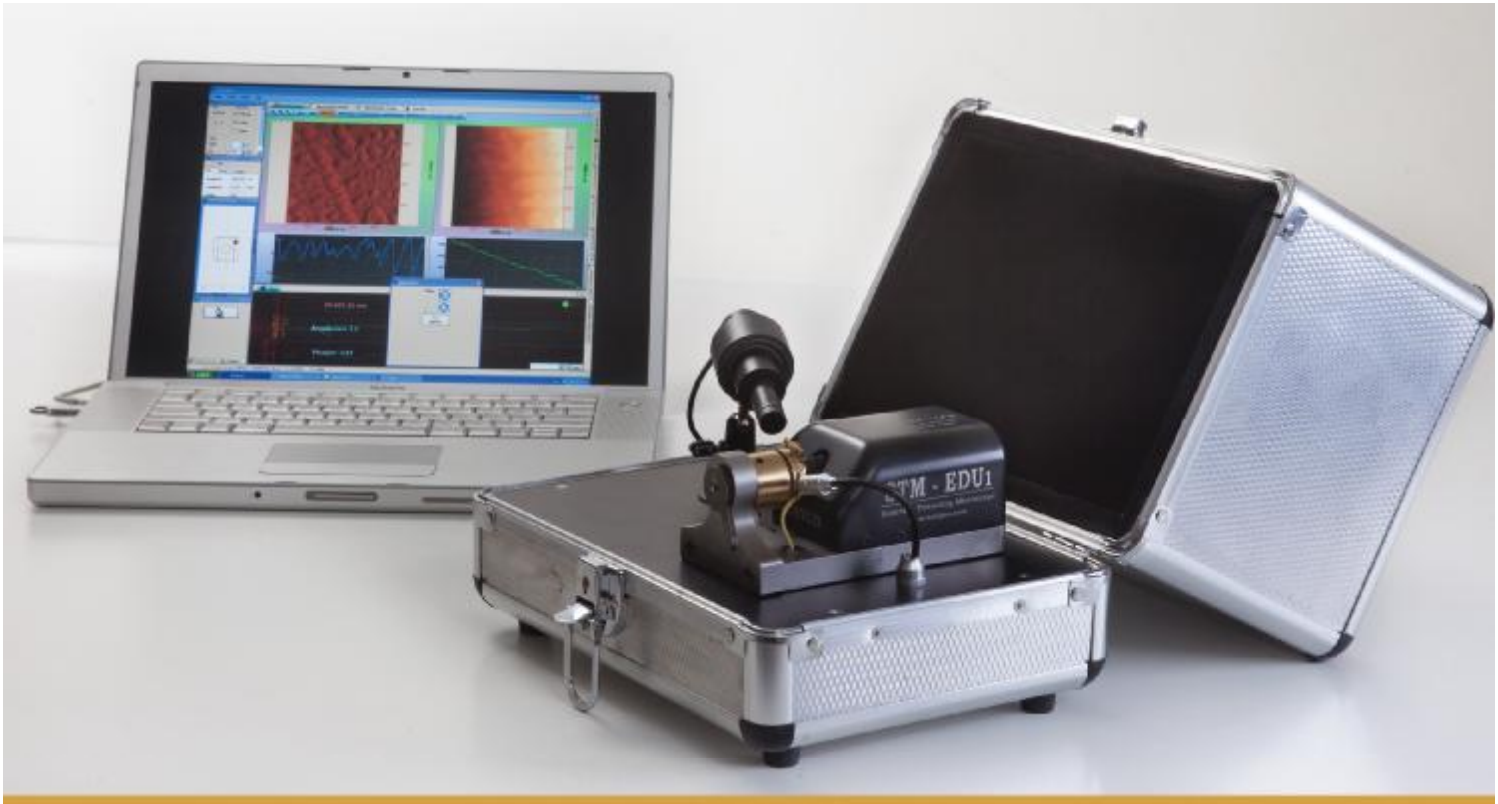
**Research:**
For graduate / post-graduate students or small labs in the fields of Nanotechnology, Chemistry, Optoelectronics, Semiconductor, Solid-State Physics ,Surface Materials, and etc.

# Applications

- **Atomic-scale imaging of solid surfaces**
- **Catalysis research**
- **Surface imaging of conductive and semi-conductive surfaces**
- **Size measurement of obtained images**
- **Roughness determination**
- **Atom and nano- structure manipulation(applicable in other versions)**
- **And so many futures for analyses your sample surface in software**

# Advantages

- **Expandable to suite user needs**
- **Designed for quick and reliable measurements by experts and novices alike**
- **Unique price/performance ratio for research and teaching**
- **Mechanical Stability**
- **Thermal drift balance**
- **Low Electronic noise**
- **Ergonomic Design**
- **Windows-Based Powerful Software**
- **Easy Maintenance**

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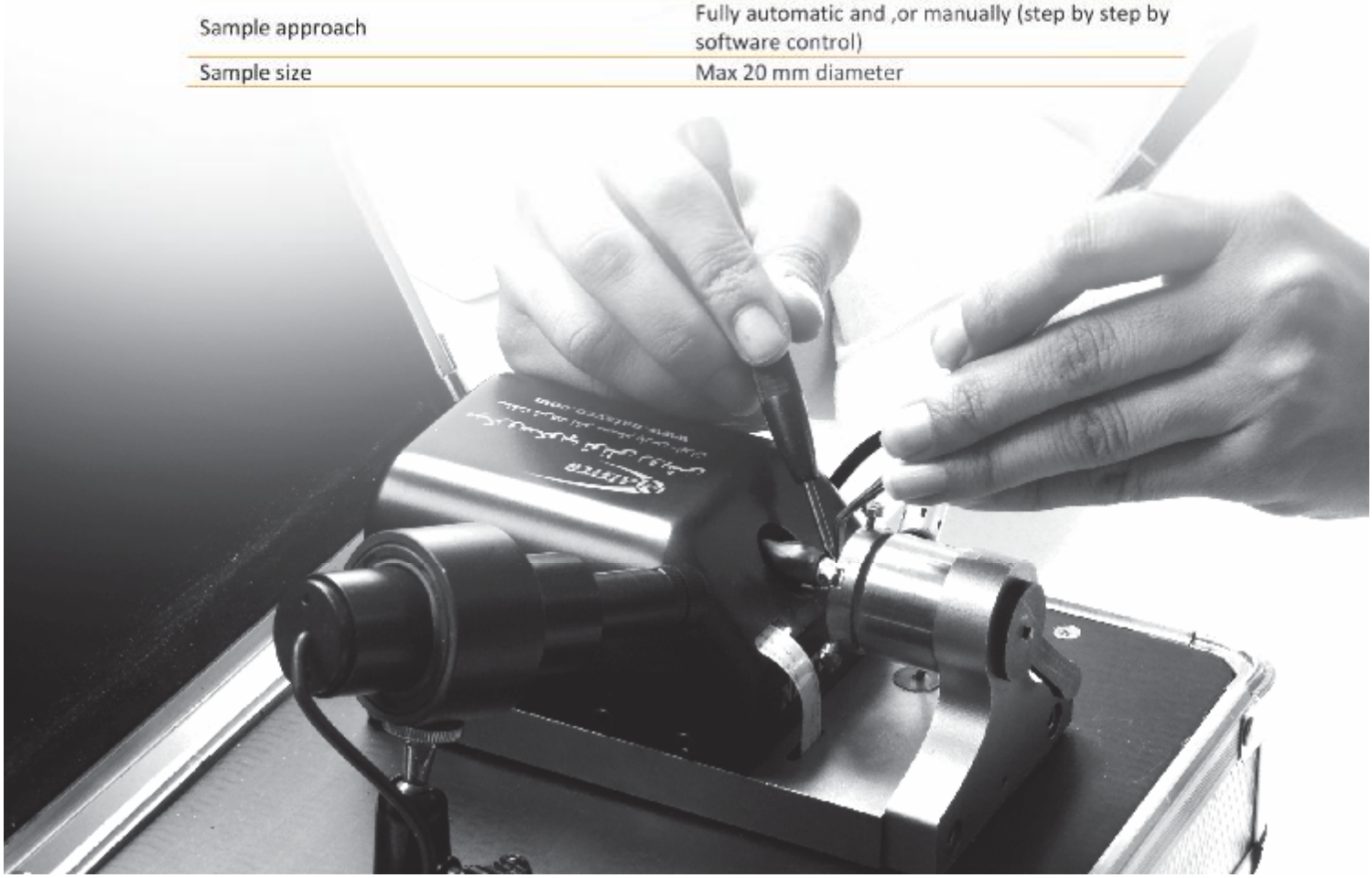
| View all maximum scan range and change parameter very user friendly | |
| Data export | TXT,BMP,JPEG,GIF, ... |
| Automatic image transfer to offline processing software NANA Analyzer | |

## Electronics

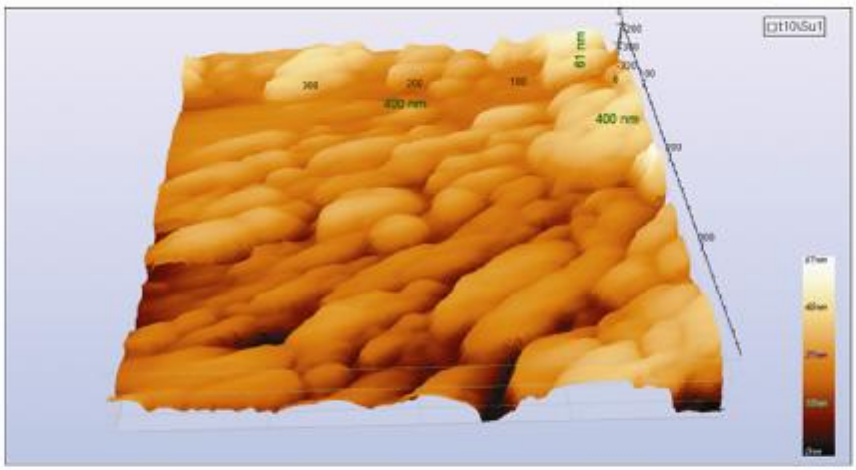
| | |
|---|---|
| Electronics size | 45*35*18 cm |
| Power supply | 220 V~/ 50 Hz/ 1A |
| Computer Interface | 16 bit Data Acquisition Hardware |
| Scan Speed | Up to 100 Line/s at 128 data point / line |
| Scan image rotation | 0 - 360° |

## STM Measurment

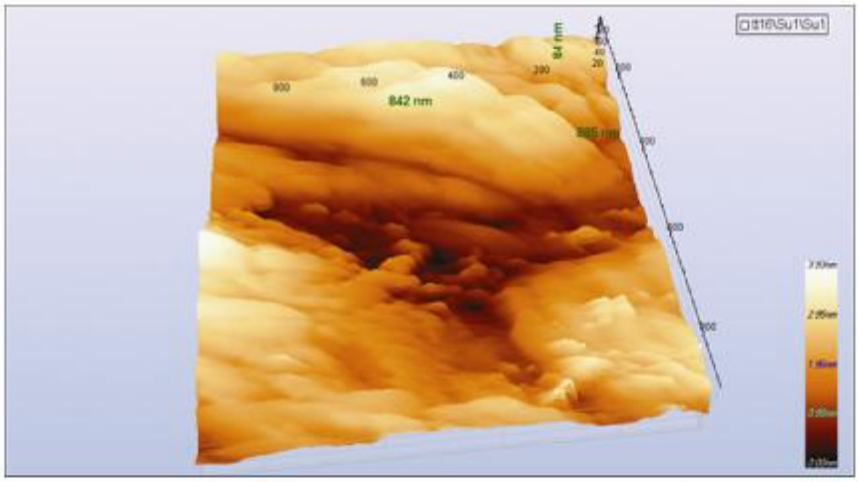
| | |
|---|---|
| Maximum Scan range | 1 µm (±500nm) |
| Maximum Z-range | 1 µm (+500 nm) |
| Derive resolution Z | 0.015 nm |
| Derive resolution XY | 0.015nm |
| Current set point | 0.02 -100 nA in 3 pA steps |
| Imaging modes | Constant current(Topography), Constant Height (Current) |
| Tip voltage | ±10 V in 0.3 mV steps |
| Sample approach | Fully automatic and ,or manually (step by step by software control) |
| Sample size | Max 20 mm diameter |



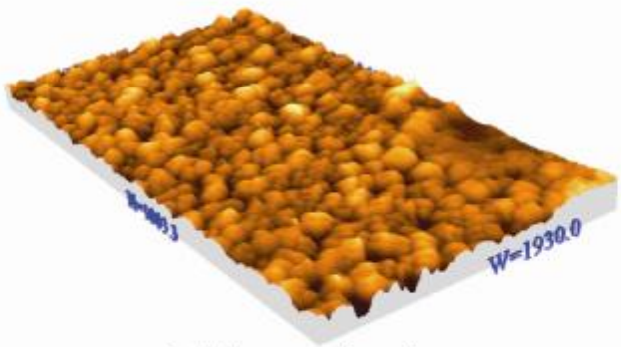
# Results



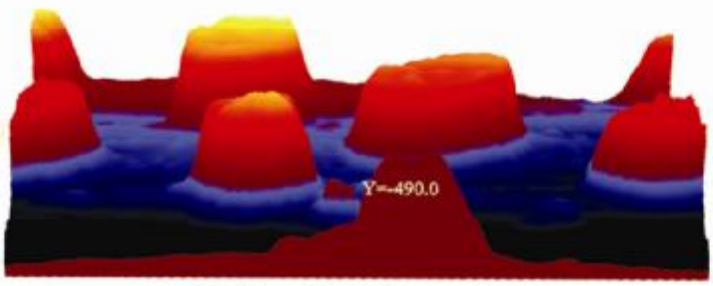

Nano fiber image by NAMA-EDU-1




Gold coated surface image by NAMA-STM-EDU-1




Gold nano structures




Calibration Sampel

# ATOMIC FORCE MICROSCOPE

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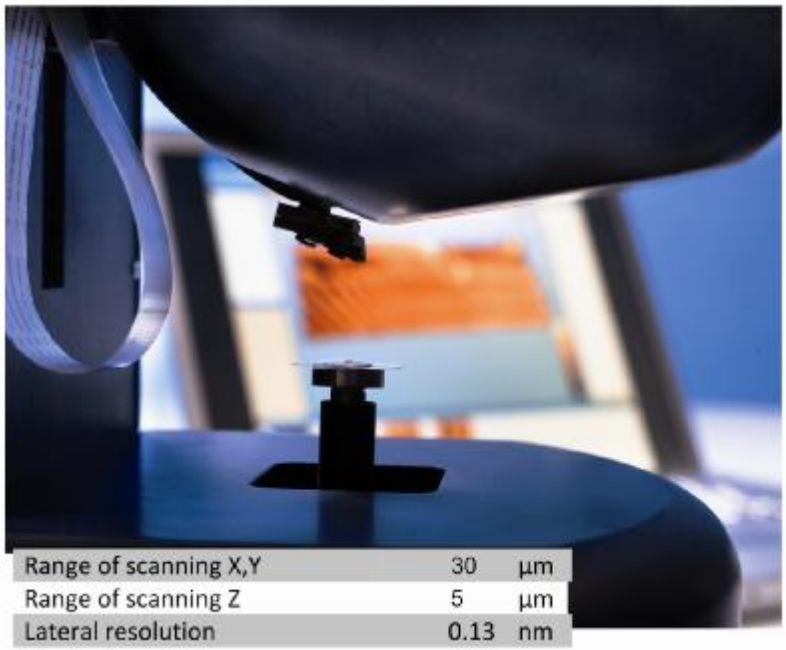

| | | |
|---|---|---|
| Range of scanning X,Y | 30 | µm |
| Range of scanning Z | 5 | µm |
| Lateral resolution | 0.13 | nm |
| Vertical resolution | 0.05 | nm |
| Scanning schema: Movable sample under stationary probe | | |
| Scanner type: Piezo ceramic | | |
| Maximum sample size | 20 | mm |
| XY Micro positioning stage | 2.5 | µm |
| Embedded video system: visualization on a PC connector via USB port from top and side. | | |
| Scanner DAC/ADC resolution | 16 | bit |


## Features

- Contact Mode (Constant Force and Constant Height Available)
- Noncontact Mode
- Semi Contact Mode
- Force Spectroscopy
- Lithography (Chemical and Mechanical)
- LFM (Lateral Force Microscopy)
- MFM (Magnetic Force Microscopy)
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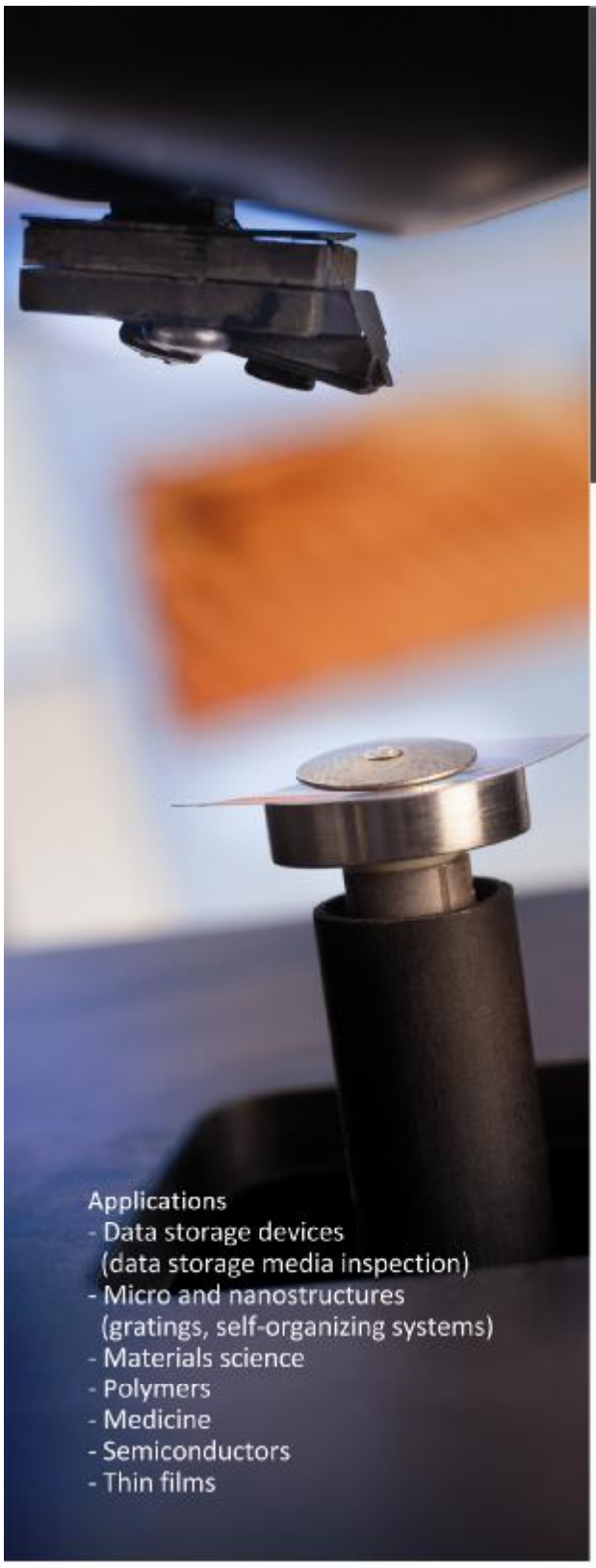
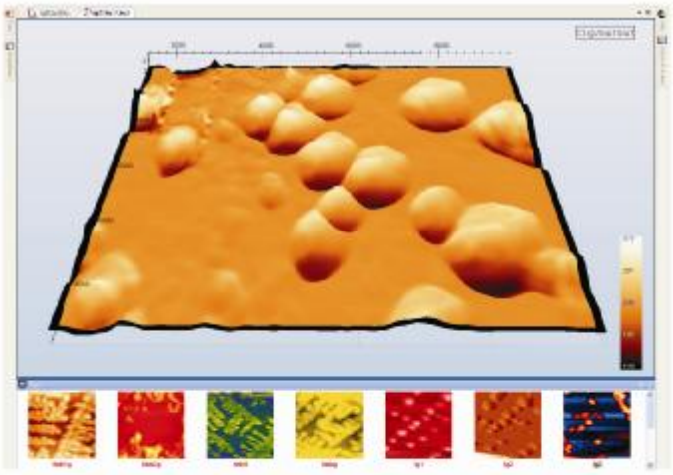


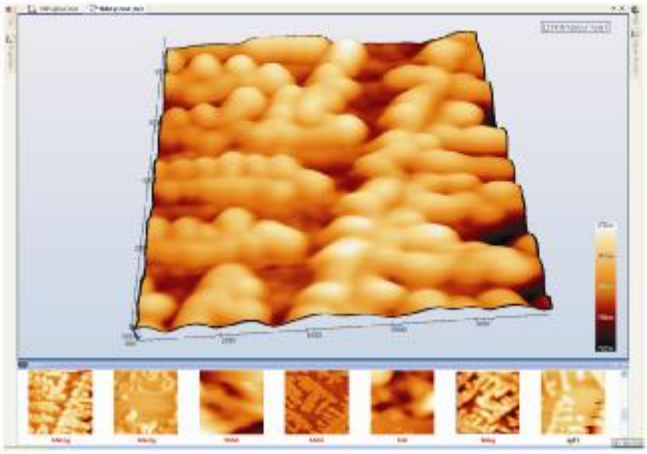
Applications
- Data storage devices
  (data storage media inspection)
- Micro and nanostructures
  (gratings, self-organizing systems)
- Materials science
- Polymers
- Medicine
- Semiconductors
- Thin films

# Advantages

- Cost-effective platform offers simple upgrade path
- Excellent educational instrument with course curriculum

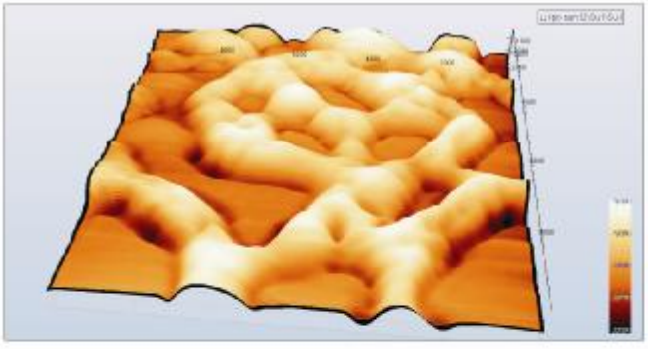


protein particles and nano structures combinations



protein particles and nano structures combinations

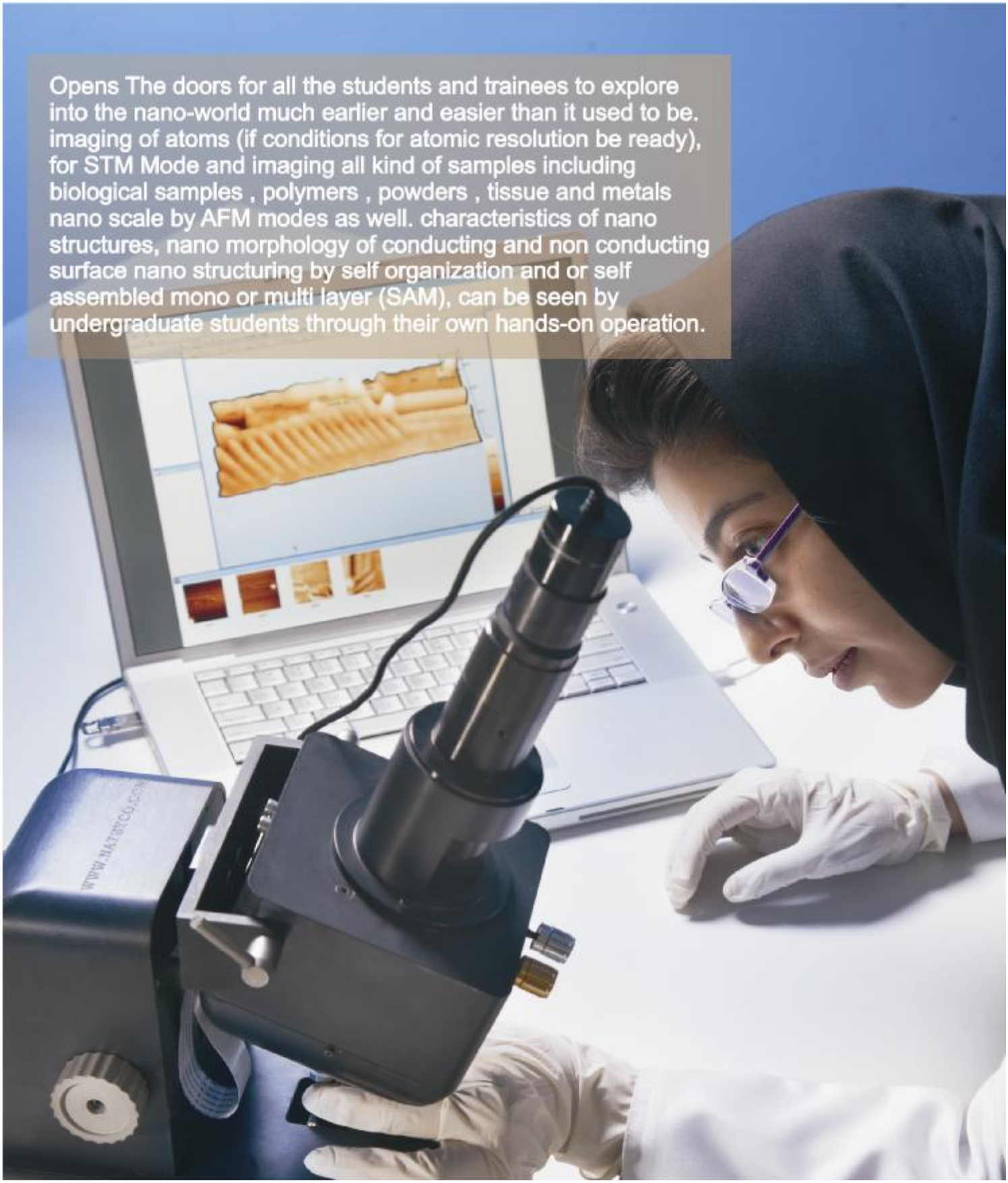
# Results



Liposome Structure on Surface of Mica Image by NAMA-AFM

# EDUCATIONAL

## Scanning Probe Microscope(EDU)



# Scanning Probe
## MICROSCOPE (EDU)

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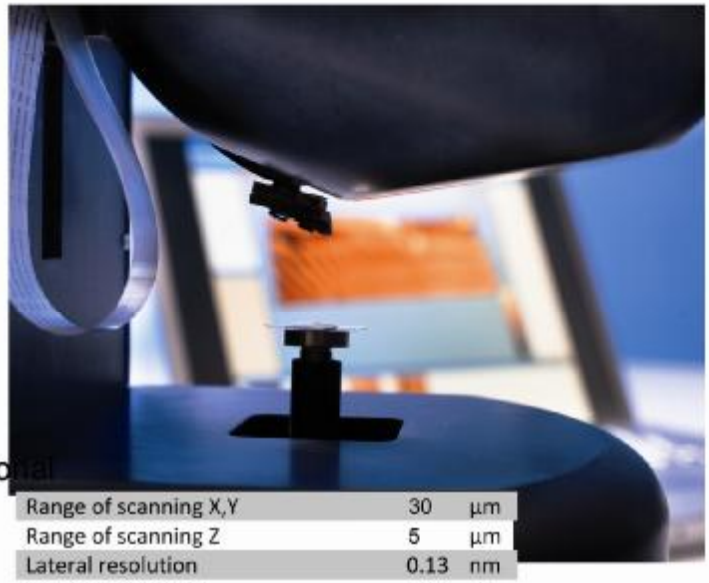

| | | |
|---|---|---|
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| Range of scanning Z | 5 | µm |
| Lateral resolution | 0.13 | nm |
| Vertical resolution | 0.05 | nm |
| Scanning schema: Movable sample under stationary probe | | |
| Scanner type: Piezo ceramic | | |
| Maximum sample size | 20 | mm |
| XY Micro positioning stage | 2.5 | µm |
| Embedded video system: visualization on a PC connector via USB port from top and side. | | |
| Scanner DAC/ADC resolution | 16 | bit |

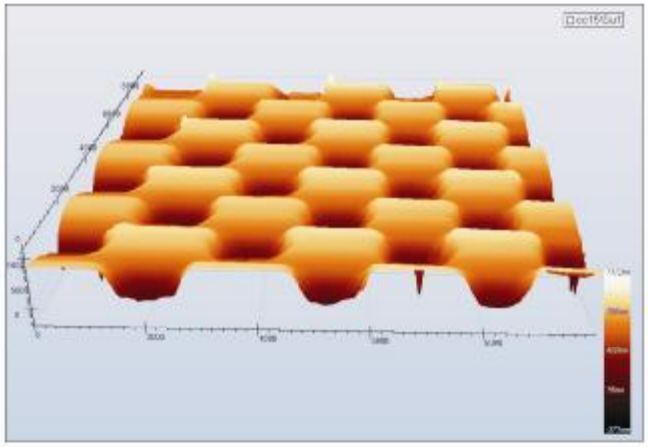

## Features

### AFM Mode:

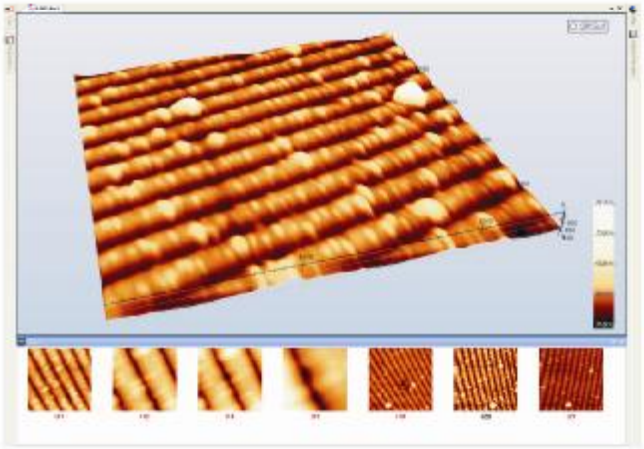
-Contact Mode (Constant Force and Constant Height Available)
- Noncontact Mode
- Semi Contact Mode
- Force Spectroscopy
- LFM (Lateral Force Microscopy)
- MFM (Magnetic Force Microscopy)
- EFM (Electrostatic Force Microscopy)
- PDM (Phases Detection Microscopy)
- FMM (Force Modulation Microscopy)

### STM Mode:

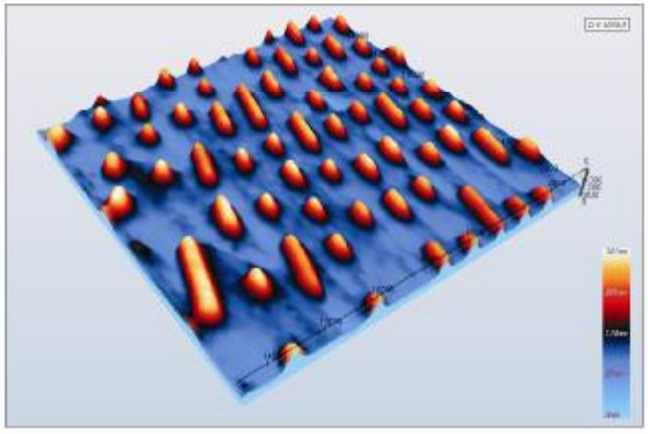
- Constant Height
- Constant Current
- Spectroscopy



Calibration Sample



DVD Surface



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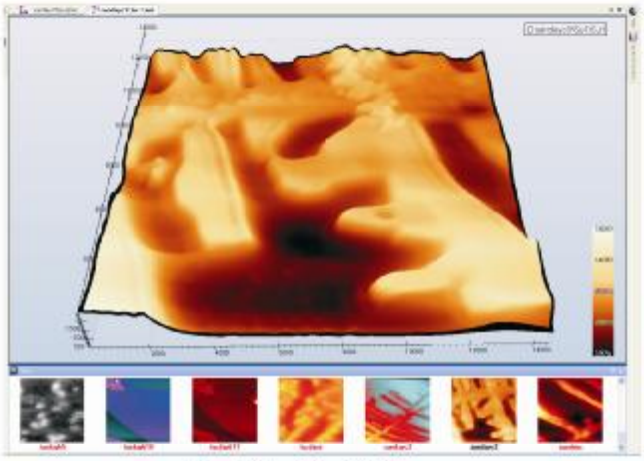
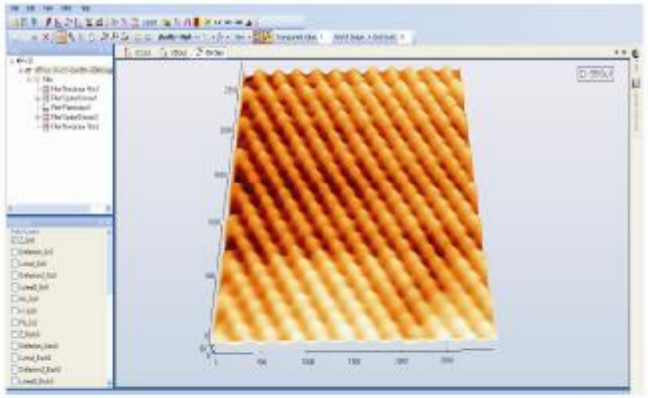


Peptide Scaffold



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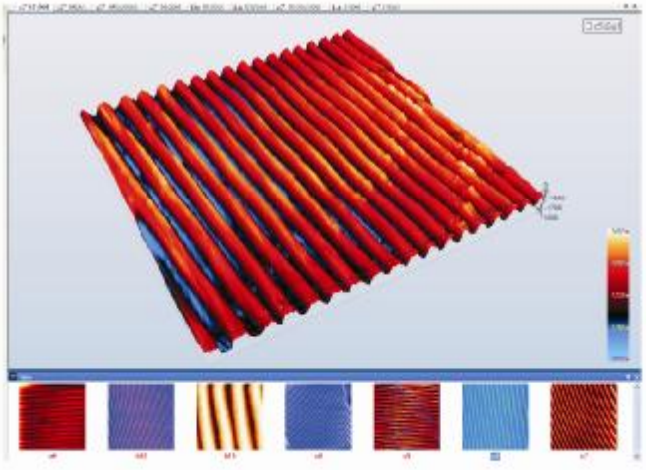

Calibration Sample

ISO 9001

043

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info@natsyco.com