



DEPARTMENT OF PHYSICS  
MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

No. PHY/MLSU/FIST/AFM/2014/1238

24<sup>th</sup> November 2014

PURCHASE ORDER

28

To

M/s NT-MDT Services and Logistics Ltd.,  
Modus Building,  
National Technological Park,  
Catletroy, Limerick  
Ireland

THROUGH

M/s Edgetech Scientific Pvt.Ltd.,  
Unit 302, IIIrd Floor  
LSC D.D.A. Market, E Block  
Vikas Puri, New Delhi 110018

REF: E-TENDER No.MLSU/PHYSICS/FIST/2014/ET-1 Item 5.Scanning Tunneling Microscope with AFM and MFM Facilities

Dear Sir,

With reference to the offer ES/NTMD/MLSU/Q-061014 Dated 6<sup>th</sup> October 2014 for Model Solver Next make ND-MDT Services Logistics, Ireland against the above cited E-tender ,We are pleased to place an order for supply of Scanning Tunnelling Microscope with AFM and MFM facilities as per following details:

Sno	Item	Qty	Cost(CIP Cost at Delhi Airport)
1	Supply, Installation and Performance demonstration of Scanning Tunneling Microscope with AFM and MFM facilities with necessary hardware and software  Model NEXT011/A SPM Solver NEXT Standard Configuration ,BL 900/A SPM controller,JST01 3D Mouse, WT_Next toolkit, SWD22 Software, MSSET/50 Accessories,TGS1 Set of 3 calibration gratings, Installation and Training as per technical specifications given below	One	US\$52200
	TOTAL		US\$ 52200/-

Technical Specifications of the Equipment

The equipment must have following specifications

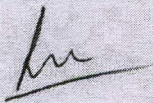
1. Fully automated SPM system usable for topography with built-in automatically interchangeable AFM and STM heads and additional removable heads for operating in liquid environments/nanoindentation, for biological samples, analysis of ultrasmall soft-matters/film, nanoparticulate films, thin films, magnetic domain imaging in the MFM mode. The cantilever holder must be compatible with most commercial cantilevers.
2. **Imaging modes:**
  - a) STM -Constant Current (Topography), Constant Height (Current)
  - b) AFM/MFM -Contact, Non contact, tapping mode
3. **Feedback for AFM** - Phase or frequency modulation feedback with high stiffness and high Q factor probes will be preferred.
4. **Sample size:** Dimensions up to 20 mm in diameter, up to 10 mm in height or equivalent
5. **Scan range/positioning:** Scanning field of dimensions 100x100x10  $\mu\text{m}$  with closed loop sensors with atleast 3x3x2  $\mu\text{m}$  in the low voltage mode. XY sample positioning 5x5 mm, motorized, video monitored with minimum XY sample positioner step of 0.15  $\mu\text{m}$
6. **Scan Resolution:** Atomic resolution with scanner having low-noise capacitive closed-loop feedback in all three directions (XYZ).
7. **Nonlinearity, XY**  $\leq 0.1\%$  (with closed-loop sensors)
8. **Noise level Z** (RMS in the bandwidth of 10-1000 Hz) 0.03 nm (typically), 0.04 nm (maximum) with closed-loop sensors, 0.02 nm in the low voltage mode
9. **Probe Details**
  - a) STM - vendor should supply Pt/Ir wire for at least one year operation.
  - b) AFM - vendor should supply at least 10 probes during installation

**10. Necessary software:**

Software for scanning, data acquisition, image processing as well as image analysis with detailed operational & service manual should be provided with the system.

Image analysis & Image modification:

- Cross section analysis
- Roughness measurement
- Grain size analysis
- Depth analysis
- Power spectral analysis
- Histogram analysis
- Fourier analysis



- Autocorrelation
- Enhanced image filtering tools
- Force-distance curve analysis
- 2D Fast Fourier analysis
- Plane-fit
- Zoom in/out
- Export to various image formats like BMP, JPG, TIFF
- Export to ASCII format and MatLab

The equipment must be installed and performance including Stability, resolution/sensitivity, reproducibility of measured data must be demonstrated by making measurement of samples provided by the university.

**Terms and conditions:**

1. The supply, installation and commission of the equipment must be made as per terms and conditions of the E-tender
2. A Performa Invoice must be submitted for the equipment to enable opening of Letter of credit.
3. The firm will be required to submit an agreement (available on web site [www.mlsu.ac.in](http://www.mlsu.ac.in)) on a Non-Judicial Stamp paper agreeing to supply and install the equipment and demonstrate the performance as per terms and conditions of the tender as per specifications of the equipment and also required to submit a Bank Guarantee/Demand Draft for 5% of the cost of the equipment Rs. 1,61,000/- on or before ~~1-12-2014~~ 8-12-2014 *lu*
4. The equipment must be supplied within a period three months from the date of opening of Letter of credit.

*Lu*

HEAD

Copy to:

1. M/s Edgetech Scientific Pvt.Ltd.,Unit 302, IIIrd Floor,LSC D.D.A. Market, E Block,Vikas Puri, New Delhi 110018 with a request to take immediate steps to obtain Performa Invoice, execute agreement and deposit 5% security before the prescribed time period.

*Lu*  
 HEAD HEAD  
 Department of Physics  
 Mahanlal Sukhadia University  
 Udaipur

C.S.  
*21h*  
 COMPTROLLER  
 Sukhadia University  
 Udaipur