Department of Electrical Engineering,
Indian Institute of Technology, Delhi

Hauz Khas, New-Delhi -110016, India

NIQ no. IITD/EE/PLN03-BEEN Due Date: **26.03.2013, 2 PM**

Notice inviting quotations for a Hybrid Scanning Tunneling Microscope (STM) and Atomic Force Microscope (AFM)

Sealed quotations are invited for a Hybrid Scanning Tunneling Microscope (STM) and Atomic Force Microscope (AFM). The purchase will be made through a two part bidding process. Technical and Financial bids have to be made separately. Complete technical information should be provided along with the Technical bid. Please refer to the page on Terms and Conditions for details on how and when to submit the Technical and Financial bids.

Required Specifications for the Hybrid Scanning Tunneling Microscope (STM) and Atomic Force Microscope (AFM)

STM Specifications

1. Scanner

Range: XY – should be at least 3 µm
Z – should be at least 0.9 µm
Resolution: should be 16 Bits

2. Tip/Sample Coarse Movement:

Stick Slip motor
Automatic: Z motion Range should be 0.5 mm
Manual: 10 mm

3. Electronics

Tunneling Current preamp: Gain: 100 mV/nA
Noise: 0.02 nA rms
Sample Bias: ± 10 V

There should be availability of 9 Pins/slots for multiple connections for user applications

4. Sample

Horizontal Sample placement
Up to 30 mm dia, 15 mm thick

5. Imaging modes – Constant current (topography), constant height (current)

6. Spectroscopy modes – Current voltage, current distance

7. Lithography – Should allow lithography

8. Camera System – Digital Camera with at least 3 megapixel sensor. The camera should have at least 10 images per second at 3 megapixel resolution or greater.

AFM Specifications

1. Compatible Probe – Quartz Tuning Fork Type

2. Dynamic Mode AFM with Intermittent Contact (Amplitude Modulation Mode) and Non-Contact (Frequency Modulation Mode)

3. Frequency Range: 15 KHz – 5 MHz

4. Should measure **Amplitude, Phase, Frequency Shift and Excitation Outputs**

5. Electric Force and Magnetic Force Measurement should be present

6. Should allow use for **Spectroscopy:** Phase, Amplitude, frequency shift v/s Distance

7. Technical Support/Consultancy for customization of the STM, AFM at customer discretion

Asst. Prof. A. Dhawan
(Principal Investigator)

Terms and Conditions

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as "Technical Bid" and "Financial Bid" respectively. Both the sealed envelopes should be sent in a single sealed envelope, clearly marked as "Quotations for a Hybrid Scanning Tunneling Microscope (STM) and Atomic Force Microscope (AFM)". The quote should reach the following address on or before **26.3.2013, 2 PM**:

Dr. A. Dhawan
Block II, Room 216,
IIT Delhi, Hauz Khas,
New Delhi, 110016, India

2. Please quote prices at FOB New Delhi, inclusive of all taxes and duties.
3. Quote should be in Indian Rupees for Indian agents, or in foreign currency, for foreign agents, and needs to be valid for at least three months.
4. Attach all the technical literature and a list of similar installations done in India.
5. If the quote is being submitted by a representative of the manufacturer, a valid agency-ship or dealership certificate authorizing the agent to quote to IIT Delhi on behalf of the manufacturers should be enclosed.
6. Complete set of manuals for the operation of the equipment should be given.
7. Clearly specify the installation requirements – such as space, power, frequency, environment etc.
8. If the item quoted is proprietary in nature, please enclose proprietary certificate from the principals stating, "Certified that _____ is a proprietary of M/s _____ and no other manufacturer makes this item."
9. Please attach a signed and stamped compliance chart for the specifications. The format of the compliance chart is attached to this document.
10. Please specify all of your terms and conditions clearly, including delivery period.
11. Preferred modes of payment for foreign agents are through letter of credit, or as payment on delivery. For Indian agents, typically payment is on delivery.
12. The Institute reserves the right to accept or reject any or all quotations without assigning any reasons thereof.

Asst. Prof. A. Dhawan
(Principal Investigator)

Compliance Chart

STM Specifications

	Parameter	Requirement	Model Spec	Complies
1	**Scanner** XY Range Z Range Resolution	 Should be at least 3 µm Should be at least 0.9 µm Should be 16 Bits		
2	**Tip/Sample Coarse Movement** Stick Slip motor Automatic Z motion Range Stick Slip motor Manual Z motion Range	 0.5 mm 10 mm		
3	**Electronics** Tunneling Current preamp: Gain: Noise: Sample Bias: Availability of Pins/slots for multiple connections for user applications	 100 mV/nA 0.02 nA rms ± 10 V 9 Pins/Slots		
4	**Sample** Horizontal Sample placement	Up to 30 mm dia, 15 mm thick		
5	**Imaging modes**	Constant current (topography), constant height (current)		
6	**Spectroscopy modes**	Current voltage, current distance		
7	**Lithography**	Should allow lithography		
8	**Camera System**	Digital Camera with at least 3 megapixel sensor. The camera should have at least 10 images per second at 3 megapixel resolution or greater		

AFM Specifications

	Parameter	Requirement	Model Spec	Complies
1	**Compatible Probe**	Quartz Tuning Fork Type		
2	**Dynamic Mode AFM**	Intermittent Contact (Amplitude Modulation Mode) and Non-Contact (Frequency Modulation Mode)		
3	**Frequency Range**	15 KHz – 5 MHz		
4	**Amplitude, Phase, Frequency Shift and Excitation Outputs**	Should measure all of these		
5	**Electric Force and Magnetic Force Measurement**	Should be present		
6	**Spectroscopy:** Phase, Amplitude, frequency shift v/s Distance	Should allow the AFM to be used for Spectroscopy		
7	**Technical Support/Consultancy for customization of the STM, AFM**	At customer discretion		