



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान मोहाली

मानव संसाधन विकास मंत्रालय, भारत सरकार द्वारा स्थापित

सैक्टर 81, नॉलेज सिटी, प.ओ. मनोली, एस. ए. एस. नगर, मोहाली, पंजाब 140306

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH MOHALI

(Established by Ministry of Human Resource Development, Govt. of India)

Sector-81, Knowledge city, PO-Manauli, SAS Nagar Mohali-140306, Punjab

PAN No. - AAAAI1781K TAN NO. PTLI10692D

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CPPP/Institute Website

IISERM(932)17/18Pur

Dated- 13th December 2017

E-TENDER NOTICE

Online tenders are invited on behalf of Director, IISER Mohali in **TWO BID SYSTEM** {Technical and Commercial} for the supply & installation of **AFM (Atomic Force Microscope) having electrochemical measurement capability** as per technical specification given below and BOQ list the original manufacturer/supplier at CPPP i.e. <https://eprocure.gov.in/eprocure/app>. Tender documents may please be downloaded from the E-procurement portal website <https://eprocure.gov.in/eprocure/app> & Institute website www.iisermohali.ac.in.

-sd-

(Mukesh Kumar)

Assistant Registrar (S&P)



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E-TENDER NOTICE

Tender Ref.- IISERM(932)17/18 Pur	Dated :- 13 th December 2017
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Critical Date Sections

Sr.	Description	Date	Time
1.	Tender Publishing Date and time	13 th December 2017	6:00pm
2.	Tender Document download start Date & Time	13 th December 2017	6:00pm
3.	Bid Submission start Date & Time	13 th December 2017	6:00pm
4.	Bid Submission End date and Time	04 th January 2017	Upto 11:00am
5.	Tender opening Date and Time	05 th January 2017	At 11.30 am

Online tenders are invited on behalf of Director, IISER Mohali in **TWO BID SYSTEM** {Technical and Commercial separately} for following item(s) from the original manufacturer/supplier at CPPP i.e. <https://eprocure.gov.in/eprocure/app>. Tender documents may please be downloaded from the E-procurement portal website <https://eprocure.gov.in/eprocure/app> & Institute website www.iisermohali.ac.in. Tender fee in shape of DD/Banker Cheque of Rs 500/- (Non-refundable) and EMD of Rs. 80,000/- should be submitted by DD /Banker Cheque/FDR/ Bank Guarantee in favour of the Registrar, IISER Mohali payable at Mohali. However, scanned copy of the both tender fee and EMD should be upload on website along with technical bid part. The hard copy of the same in original to be send to the address mentioned below duly superscribing the supply/work name and reference/ tender ID on the envelope and same must reach before opening the bid and if not received within due date the bid will be rejected summarily.

The Original EMD and tender fee should be sent to:

Assistant Registrar (S&P)
Indian Institute of Science Education and Research,
Mohali Sector 81, SAS Nagar, Mohali, Punjab, India,
Pin: 140306

Non-receipt of original EMD and tender fee will lead to rejection of tender.

Item Details:-

Sr	Details of Specifications	Qty.
01	AFM (Atomic Force Microscope) having electrochemical measurement capability – {Technical Specifications as enclosed}	01

NB:- The online updated Price BOQ is in INR format. If bidder want to quote other than INR please specify the quoted currency in the technical bid/part and fill the amount in same updated BOQ.

SUBMISSION OF TENDER

- I. All bid/ tender documents are to be uploaded online at Central Public Procurement portal i.e. <https://eprocure.gov.in/eprocure/app> only and in the designated cover/ part on the website against tender ID. Tenders/ bids shall be accepted only through online mode and no manual submission of the same shall be entertained except tender fee and EMD. Late tenders will not be accepted.
- II. The online bids shall be opened at the office of the Assistant Registrar (P&S), IISER Mohali, on above given date and time. If the tender opening date happens to be on a holiday or non-working day due to any other valid reason, the tender opening process will be attended on the next working day at same time and place. IISER Mohali will not be responsible for any error like missing of schedule data while downloading by the Bidder.
- III. The bidder shall upload the tender documents duly filled in and stamped by the authorized signatory on each and every page. Tender not submitted/uploaded in the prescribed form and as per the tender terms and conditions shall be liable for rejection.
- IV. The bidder shall upload scanned copy of the PAN Card, GST number duly signed and stamped.
- V. E-procurement system ensures locking on the scheduled date and time. The system will not accept any bid after the scheduled date and time of submission of bid.

INSTRUCTIONS

1. The Online bids should be submitted directly by the original manufacturer/supplier, If quotation is submitted/filled by any representative/agent/dealer then they must upload a authority certificate from the principal company for quoting the price otherwise such quotation will be rejected.
2. The quantity mentioned in this inquiry is and shall be deemed to be only approximate and will not in any manner be binding on the Institute. Before the deadline for submission of the online bid, IISER Mohali reserves the right to modify the tender document terms and conditions. Such amendment/modification will be notified on website against said tender ID
3. The rates offered should be FOR Chandigarh/Mohali in case of firms situated outside Chandigarh/Mohali, and free delivery at the Institute premises in case of local firms. Supplier from outside India should mention the Ex-works/FOB/FCA/CIF/CIP price clearly. Conditional tenders will be summarily rejected.
4. In case of Ex-godown terms the amount of packaging forwarding freight etc. should clearly be indicated by percentage or lump sum amount. Institute has policy not to make any advance payments towards any purchase, Letter of credit can be opened if required.

5. THE INSTITUTE IS EXEMPTED FROM EXCISE AND CUSTOM DUTY under notification no- 51/96 – CUSTOM DATED 23/7/1996 AND DSIR REGISTRATION NO TU/V/RG/-CDE(1062)/2016 DT. 30/08/2016 / EXCISE NOTIFICATION NO. 10/97- CENTRAL EXCISE DT. 01.03.1997.
6. Tax: This Institute is not exempted from the payment of GST. The current rate (i.e. percentage of Sales Tax should be clearly indicated included or excluded) wherever chargeable. Please also provide/upload the copy of PAN card, GST number duly self-attested.
7. The delivery period should be specifically stated. Earlier delivery will be preferred.
8. The firms are requested to provide/upload detailed description and specifications together with the detailed drawings, printed leaflets and literature of the article quoted. The name of the manufactures and country of manufacture should also invariably be stated. In the absence of these particulars, the quotation is liable for rejection.
9. Validity of offer: 90 days. The warranty period after satisfactory installation should be mentioned and firm should replace all manufacturing defect parts/ whole item under warranty without any extra cost including clearance, freight, taxes. Security deposit/ Bank Performance Guarantee @ 10 % of the value of supply order as per norms may be sought from the firms.
10. The right to reject all or any of the quotation and to split up the requirements or relax any or all the above conditions without assigning any reason is reserved by the IISER Mohali. For any corrigendum and addendum please be checked the website <https://eprocure.gov.in/eprocure/app> and <http://www.iisermohali.ac.in>
11. Disputes, if any, shall be subject to jurisdiction in the court of Mohali only.

–sd/-
(Mukesh Kumar)
Assistant Registrar (S&P)

To supply, deliver, install and commissioning of “Atomic Force Microscope” ATOMIC FORCE MICROSCOPE

The Atomic Force Microscope (AFM) should be a high end research equipment with the ability for upgradation for measurements apart from the ones specified in the instrument. It should be capable of imaging and measuring of atomic resolution for nanomaterial samples. The system provided should be a complete system inclusive of all necessary computers, software, hardware, and accessories for all the specified imaging modes.

The Atomic Force Microscope should meet the specifications and requirements as stated below:

1. The system should consist of:

- i. Main unit with standard microscopy imaging modes operated on Contact mode, tapping mode and non-Contact mode (or equivalent mode).
- ii. Supply of a complete 3D Scanning System with accessories for high resolution imaging.
- iii. System should be able to do imaging of soft material (Polymers, Biological samples) as well as material science
- iv. Accommodate large samples at least 50 x 50 x 10 mm (xyz),
- v. Allowable sample weight up to 200 g or more.
- vi. PC and Software
- vii. Accessories

2. Features should include:

2.1. Scan modes

- 2.1.1. Basic Contact AFM
- 2.1.2. Intermittent (tapping) AFM observation
- 2.1.3. Non-Contact (or equivalent) AFM
- 2.1.4. Lateral Force Microscopy (LFM)
- 2.1.5. Phase Imaging
- 2.1.6. Force Distance (F-D) Spectroscopy
- 2.1.7. Liquid imaging mode accessories
- 2.1.8. Scanning Kelvin Probe Microscopy
- 2.1.9. Variable Enhanced Conductive AFM
- 2.1.10. MFM should be integrated

2.2. Scan head

- 2.2.1. Should be able to be used for various advance modes without the need of changing another AFM head.
- 2.2.2. On-axis vision support for the sample and cantilever from the top. Sufficient digital zoom should be there for selected region with ~400 micrometer x 400 micrometer field of view.
- 2.2.3. Using SLD (Super Luminescent Diode) with >800 nm wave length, and with coherent length less than 50 μm .

2.3. XY & Z Scanner

- 2.3.1. The XY scanner should have both open loop and closed-loop feedback system.
- 2.3.2. Scan range : motorised XY range of at least 75 μm or more and motorized Z range of at least 10 μm or more
- 2.3.3. Scan resolution 0.6nm or better for XY axis in close loop and 0.2 nm (RMS) or better for Z axis.
- 2.3.4. XY scanner Z height noise should be 0.03 nm or less.
- 2.3.5. The Z-scanner, which controls the vertical movement of the SPM tip, is completely

separated from the XY-scanner which moves sample in XY horizontal directions.

2.3.6. XY-scanner when used to scan a sample in the X and Y directions should guarantee its highly orthogonal 2D movement with minimum out-of-plane motion, which should have less than 1 nm of out-of-plane motion for the scan range of 50 μm .

2.3.7. The Z scanner must have feedback speed with resonant frequency 5 kHz or better.

2.3.8. The XY-Z scanner should have Mechanical XY-Z orthogonality error less than 1°

2.4. Non-Contact Mode

2.4.1. The Non-Contact mode of AFM system must not touch the sample surface at all during topography imaging in ambient, to save tip operation cost and to secure sample from damage.

2.4.2. Supplier must prove this capability by using tungsten film sample, run the scan for at least 5 times using 1 single cantilever tip, and show no degradation in image quality and profile line generated.

2.4.3. Supplier must prove this capability by using soft-gel type sample (i.e. hair gel), run the scan and show neither defect generated on sample surface nor cantilever trapped when scanning.

2.5. Stages should have

2.5.1. High quality manual XY stage and motorized Z stage.

2.5.2. XY stage should have at least 10 mm \times 10 mm moveable range and with manual precision movement (micrometer built-in to the stage)

2.5.3. The working range of Z stage should be at least 20 mm with 0.2 μm resolution, 2 μm repeatability or better.

2.5.4. Should have Q control circuit

2.5.5. Motorized Z stage movement should be backlash-free harmonic gear reduction movement

2.5.6. It must allow automated cantilever approach using the motorized Z stage

2.6. Cantilevers and probe tip

2.6.1. Probe tip exchange must be very convenient without requiring special tools or head removal.

2.6.2. The AFM system should allow user to mount cantilever purchased from 3rd party.

2.6.3. Supplier should include at least 30 tips for each mode

2.7. Microscope Vision support

2.7.1. The AFM system must provide on-axis view of sample and cantilever from top

2.7.2. The AFM vision system must come with an 5X or higher optical objective lens.

2.7.3. The AFM system must come with manual focus stage with 70 mm Z travel range

2.7.4. The AFM optic & camera system should provide magnification at least 500x when displayed on a 23 inch LCD monitor.

2.7.5. The optic & camera system should have resolution of 1 μm or better

2.7.6. The vision system should have equivalent field of view of 400 μm \times 300 μm or better using 10x objective lens.

3. PC, Software and accessories

3.1. PC should be with below specification or better:

3.1.1. Intel(R) Core(TM) i5 CPU or compatible

- 3.1.2.8 GB RAM, 2× 160 GB Hard Disc Drives
- 3.1.3. Dual 23 inch LED monitors (1920 × 1080 pixel, DVI)
- 3.1.4. Graphic Card: Geforce GT430 graphics card or compatible
- 3.1.5. Operating System: Microsoft Windows 7 Professional 32 bit (English)
- 3.1.6. A LASER printer with copier should be provided
- 3.1.7. 10 no. of 16 GB or better pen drive should be provided

3.2. Software

3.2.1. The AFM system should have separate software for data analysis and measurement.

3.2.2. Able to perform multi-tasking with Windows based data acquisition, or equivalent, and imaging processing programs at the same time.

3.2.3. The measurement software should have:

3.2.3.1. Multiple data acquisition and display

3.2.3.2. F-d spectroscopy control

3.2.3.3. Adjusting feedback gain, set point, drive frequency /amplitude /phase in real time.

3.2.3.4. Seamless data transfer to the analysis software

3.2.4. The data analysis software should have:

3.2.4.1.1. Platform-independent software.

3.2.4.1.2. 'Copy to Clipboard' function for convenient presentation editing

3.2.4.1.3. Running on Microsoft Windows.

3.2.4.1.4. The data should be able to be viewed in Top View, 3 D view, Z height color, and etc.

3.2.4.1.5. Line view should also can be done to perform line measurement.

3.2.4.1.6. Able to perform functions to include profile tracer, line measurement of height, line profile, power spectrum, average roughness, volume, surface area, Ry, Rz, grain analysis etc

3.2.4.1.7. Copy to clipboard function for convenient presentation editing

3.2.4.1.8. Should provide a free update of the software (with new features) for next 5 years.

4. AFM Controller

4.1. The AFM controller should come with a high performance processing unit within digital signal processing of 600 MHz and 4800 MIPS.

4.2. The electronic signal inputs should be at least 20 channels of 16 bit ADC at 500 kHz sampling.

4.3. The electronic signal outputs should be at least 21 channels of 16 bit DAC at 500 kHz settling.

4.4. Feedback frequency should be at least 500kHz.

4.5. Enables simultaneously acquisition up to 16 images.

4.6. Enable acquisition of image up to 4096 × 4096 pixels.

5. Accessories

5.1. Acoustic Enclosure

5.1.1. Table top acoustic enclosure type, not build in with AFM.

1.1.1. Hermetically sealed acoustic enclosure blocking acoustic noise and ambient light noise. The enclosure must provide 20dB or less of acoustic isolation.

1.1.2. Standard samples for all the modes should be provided for periodic calibration and monitoring.

1.2. Vibration Isolation system

1.2.1. Provides active vibration isolation (with all necessary accessories) with direct velocity feedback via electromagnetic transducers to cancel out the floor vibration in order to achieve the stated resolution. (Active 1 Hz to 1 kHz, Isolation level 50 dB or better)

6. **Additional SPM modes to be included:** Conductive AFM, MFM, EFM and Scanning Kelvin Probe Microscopy for high resolution and high sensitivity imaging of surface potential.
7. **Calibration:** AFM calibration kit with necessary standard samples (Mica, HOPG...etc.) and other tools must be provided.
8. **Substrate:** Suitable substrates for the proposed measurements should be provided.
9. A scanner with a smaller range and better attainable resolution (>0.005 nm) should be quoted *separately*.
10. The AFM should be capable of upgradation with electrochemical and chemical force microscopy, force modulation microscopy, scanning thermal microscopy, photocurrent mapping, piezoelectric force microscopy without change of scanner head.
11. **Site preparation** should be quoted *separately*.
12. **Warranty:** Must include three year of standard warranty on all parts and labour. Free software upgrade for the life of the instrument.
13. **Training:** 7 days in-house training on different modes of the AFM. 6 monthly visit and further training for new set of users for atleast two years after the initial training. Training must include all aspects of AFM operation including troubleshooting. Must dedicate separate timeslot for every mode of operation.