



**NATIONAL INSTITUTE OF TECHNOLOGY  
ROURKELA – 769 008, ODISHA**

**Advertised Tender Enquiry**

**Department: Physics and Astronomy**

**Tender notification no: - NITR/PW/PH/2019/126**

**Date: 14/06/2019**

**Important Dates**

**To,**

**Through  
CPP Portal  
(e-Procurement)**

<b>Event</b>	<b>Date</b>	<b>Time</b>
Pre-bid Conference	<b>NA</b>	<b>NA</b>
Last Date of submission of bid	<b>11/07/2019</b>	<b>03:00 PM</b>
Date of opening of techno-commercial bid	<b>12/07/2019</b>	<b>03:00 PM</b>

Dear Sir,

We intend to purchase the commodities specified below and invite quotations in accordance with the terms and conditions detailed in the bid document. If you are interested, kindly send your offer with prices and complete terms within the time mentioned above.

For any clarification:

**ATTENTION:**

Principal Investigator: **Prof. Jyoti Prakash Kar**  
Department of Physics and Astronomy  
NATIONAL INSTITUTE OF TECHNOLOGY  
ROURKELA – 769 008, ODISHA  
Phone – 0661 - 2462732

Yours sincerely,

\_\_\_\_\_  
Name: Prof. Jyoti Prakash Kar  
Associate Professor

**Encl:**

- (1) Schedule of requirement, specifications, dates etc.**
- (2) Bid document containing detail terms and conditions.**

**1. Schedule of requirements**

Item No	DESCRIPTION	Quantity
1	<b>Atomic Force Microscope (AFM)</b>	<b>1 Unit</b>

**2. Specifications and allied Technical Details**

\* Attach User list along with the quotation

**3. Format of Quotation** (tick appropriate box)

It is a two part bid with separate techno-commercial and price bids

4. The bid should be submitted through <https://eprocure.gov.in/eprocure/app>

5. Quotations should be valid for a period of **90 days** from the closing date of the bid.

**6. Some important dates:**

i. Pre-bid Conference	Date: <b>NA</b>	Time: <b>NA</b>
ii. Last date for submission of Bid:	Date: <b>11/07/2019</b>	Time: <b>03:00 PM</b>
iii. Date of opening of techno-commercial bid	Date: <b>12/07/2019</b>	Time: <b>03:00 PM</b>

7. **Warranty** of minimum **01** years must be provided.

8. **GST:** GST should be charge according to applicable rates.

9. **Bid Security(EMD) and Tender Cost:** Bid Security(EMD) in shape of DD (Demand Draft) for **INR 54,000/- (Rupees Fifty Four Thousand Only)** and **Tender Cost (Non-refundable)** in the form of DD for **INR 500/- (Rupees Five Hundred Only)** in favor of **Director, NIT Rourkela** Payable at Rourkela from any Scheduled Commercial Bank except Co-operative and Gramin bank. And DD for the Bid-Security should remain valid for a period of **45 days** beyond the bid validity period from the date of opening of bids. Bid security of unsuccessful bidders should be return to them at the earliest and latest on or before the **30<sup>th</sup> days** after the award of the contract. **EMD (Earnest Money deposit)** and **Tender Cost** should reach physically through speed post/ register post/courier, containing in an envelope & superscripted with subject, tender reference number addressing to **Registrar, NIT Rourkela-769008, Odisha**; Attention: HOD(PH) on or before **12/07/2019 at 03:00 PM**

10. **Performance Security: INR 1, 35,000/- (One lakh thirty five thousand only)** in shape of Demand Draft (DD)/Bank Guarantee in favour of Director, NIT Rourkela and payable at Rourkela. And Performance security should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the suppliers including warranty obligation. And EMD (Earnest Money Deposit) amount of successful bidder will be return after the receipt of performance security in case of award of contract to successful bidder.

11. Please go through the enclosed "bid document" carefully for other bidding instructions.

12. Please send your quotations through <https://eprocure.gov.in/eprocure/app>

**13.** For technical details, you may contact

**Prof. Jyoti Prakash Kar**

Associate Professor

Department of Physics and Astronomy,

National Institute of Technology,

Rourkela - 769 008

Phone: 0661 - 2462732

E-mail: [karjp@nitrkl.ac.in](mailto:karjp@nitrkl.ac.in) ; [jpkar45@gmail.com](mailto:jpkar45@gmail.com)

NB: ***Please furnish your Dealership Certificate (must) and Proprietary Nature Certificate (If applicable)***



**SPONSORED RESEARCH, INDUSTRIAL CONSULTANCY & CONTINUING  
EDUCATION CELL  
NATIONAL INSTITUTE OF TECHNOLOGY  
ROURKELA – 769 008, ORISSA**

**BID DOCUMENT**

**1. Instructions to the bidders**

- 1.1 Bids are invited on behalf of the Director, National Institute of Technology (NIT), Rourkela – 769 008, Orissa, from the intending bidders for supply of the goods/stores/ equipment for the Institute as detailed in the enquiry letter.
- 1.2 The bidders should quote their offer/rates in **BOQ** in clear terms without ambiguity.
- 1.3 In case of any discrepancy between the rates in figures and that in words, the rate in words will be accepted as correct.
- 1.4 The last date for receipt of the bid is marked in the enquiry.
- 1.5 The bids should be uploaded in <https://eprocure.gov.in/eprocure/app> Please follow the guidelines of the site.
- 1.6 If a prospective bidder requires any clarification in regard to the bidding documents, he may make a request the concerned officer or faculty member at least 15 days before the deadline for receipt of bids.
- 1.7 Bids received after the deadline of receipt indicated in para 1.4 above, shall not be taken in to consideration.
- 1.8 Each bidder shall submit only one bid. A bidder, who submits more than one bid, shall be disqualified and considered non-responsive.
- 1.9 (In respect of high value plant, machinery etc. of a complex and technical nature). The bids may be submitted in two parts, viz., technical bid and financial bid.
- 1.10 The bidder has to sign in full at all pages of the scanned part of the bidding document. No over-writing in those pages is acceptable.
- 1.11 For the supply of Atomic Force Microscope(AFM), the quoted price will be upto CIF Kolkata.

**2. Conditions of the bid**

- 2.1 The rates quoted should preferably be net, inclusive of packing, forwarding, freight, Insurance and all other incidental charges excluding taxes. In case these charges are quoted extra in addition to the quoted rates, the amount thereof or Ad Valorem rate must be specified. Packing, forwarding, freight, entry tax etc., when quotes separately are reimbursable at actual. If external agencies are employed, their receipts must be enclosed with the invoice.
- 2.2 Duties and Taxes are to be quoted separately. Ad Valorem rates thereof should be clearly indicated with reference to the relevant Acts and Rules.

**It may be noted that the Institute is availing custom duty exemption in terms of notification no 51/96- Customs dt. 23.07.1996, Notification No. 47/2017- Integrated Tax (Rate) dt.14.11.2017 and Notification No- 45/2017- Central tax (Rate) dt. 14.11.2017 [vid Registration No: TU/V/RG-CDE (227)/2016, dated: 13.11.2018].**

- 2.3 The goods are required to be delivered at the indenting Department of NIT, Rourkela, and must be reached within **90 days** from the date of placement of the supply of order under the risk and arrangement of the bidder and offers with delivery beyond the above period shall be treated as unresponsive. In case the delivery time is higher, the same must be mentioned clearly in the quotation.
- 2.4 The bid should remain valid for a period of **90 days** from the date of opening. In case your offer has a different validity period that should be clearly mentioned in the quotation.
- 2.5 Conditional discount, if any, offered by the bidder shall not be considered at the time of evaluation.
- 2.6 The goods offered should strictly conform to the specification and technical details mentioned in **Annexure-I**.
- 2.7 The Institute may like to conduct pre-dispatch inspection of goods, where applicable.
- 2.8 Period of guarantee/warranty, where applicable, should be specified in the bid.
- 2.9 If the successful bidder, on receipt of the supply order, fails to execute the order within the stipulated period, in full or part, it will be open to the Director, NIT, Rourkela to recover liquidated damage from the firm at the rate of 1 percent of the value of undelivered goods per month or part thereof, subject to a maximum of 5 percent of the value of undelivered goods. Alternatively, it will also be opened to the Director, to arrange procurement of the required goods from any other source at the risk and expenses of the bidder.
- 2.10 The successful bidder may be required to execute a contract, where applicable.
- 2.11 The bidder has to furnish up to date GST and Income Tax Clearance Certificate along with the bid.
- 2.12 Payment (100 percent) will be made by Account Payee Cheque /Bank Draft, within 30 days from the date of receipt of the goods in good condition or receipt of the bill, commissioning of the equipment, and after successful installation and demonstration where ever applicable, whichever is later/latest.
- 2.13 In case of Advance payment, the payment will be made on either in Foreign Demand Draft or Wire Transfer only. The proforma invoice copy need to be sent for advance payment.
- 2.14 In the event of any dispute arising out of the bid or from the resultant contract, the decision of the Director, NIT, Rourkela shall be final.
- 2.15 The bid document/resultant contract will be interpreted under Indian Laws.

**Specifications for Atomic Force Microscope (AFM)****Supply, installation, commissioning, demonstration and training of “Atomic Force Microscope”**

The Atomic Force Microscope system should be capable of imaging and measuring features of a specimen (Atomic Step Resolution). The system provided should be a complete system inclusive of all necessary computers, software, hardware, accessories and tools for all the specified imaging modes.

<b>Sl. No.</b>	<b>ITEM</b>	<b>Technical Specifications</b>
1	<b>System Description</b>	<p><b>1. The system should consists and capable of:</b></p> <ul style="list-style-type: none"> <li><b>i.</b> Main unit with standard microscopy imaging modes for operation under Contact, Tapping, Non-Contact, Lateral Force, Phase Imaging, Force-Distance Spectroscopy.</li> <li><b>ii.</b> Supply of a complete 3D Scanning System with accessories for high resolution imaging.</li> <li><b>iii.</b> Accommodate large samples at least 100 x 100 x 20 mm (xyz), must come with manual x, y stage and z motorized movement with software controlled pitch and tilt corrections.</li> <li><b>iv.</b> PC and Software</li> <li><b>v.</b> All accessories and tools</li> </ul>
2	<b>Scan modes</b>	<ul style="list-style-type: none"> <li><b>I.</b> Contact AFM</li> <li><b>II.</b> Tapping Mode</li> <li><b>III.</b> Non-Contact AFM</li> <li><b>IV.</b> Lateral Force Microscopy (LFM)</li> <li><b>V.</b> Phase Imaging</li> <li><b>VI.</b> Force Distance (F-D) Spectroscopy</li> </ul> <p>The system should support the following modes: EFM, MFM, Nanoindentation, PFM, PFM with high voltage, SThM, Nanolithography, Conductive AFM, I-V Spectroscopy, SKPM, Sample heating &amp; cooling etc.(Future upgradation)</p>
3.	<b>Scanner</b>	<ul style="list-style-type: none"> <li><b>I.</b> Flexure guided/Piezo Tube scanner.</li> <li><b>II.</b> The scanner should have closed-loop feedback system.</li> <li><b>III.</b> The AFM should be a XY sample scanning system.</li> <li><b>IV.</b> <b>Scan range</b> :XY range of at least 50 <math>\mu\text{m}</math> x 50 <math>\mu\text{m}</math> and Z range of at least 12 <math>\mu\text{m}</math>;</li> <li><b>V.</b> <b>Z noise floor:</b> 0.03nm</li> <li><b>VI.</b> The movement of X-Y-Z scanner should be completely decoupled and independent from other axis movement.</li> <li><b>VII.</b> The XY-scanner when used to scan a sample in the X and Y directions should guarantees its highly orthogonal 2D movement with minimum out-of-plane motion, which should have less than 1-2 nm of out-of-plane motion for the scan range of about 50 <math>\mu\text{m}</math>.</li> <li><b>VIII.</b> The Z scanner must have high feedback speed with resonant frequency 3 kHz or better.</li> <li><b>IX.</b> Should be provided with a scanner alignment kit</li> </ul>
4	<b>Sample Stage</b>	<ul style="list-style-type: none"> <li><b>I.</b> High quality manual XY stage and motorized Z movement.</li> <li><b>II.</b> XY stage should have at least 10 mm <math>\times</math> 10 mm moveable range and with manual precision movement (micro meter built-in to the stage.</li> <li><b>III.</b> The working range of Z movement should be at least 25 mm with</li> </ul>

		<p>high precision and repeatability.</p> <p><b>IV.</b> Motorized Z movement should be backlash-free.</p> <p><b>V.</b> The AFM system must allow automated cantilever approach using the motorized Z movement.</p>
5	<b>Optics</b>	<p><b>I.</b> The AFM system must provide on-axis view of sample and cantilever from top. The AFM vision system must come with a 1MP CCD camera.</p> <p><b>II.</b> The vision system should provide field of view of <math>470\ \mu\text{m} \times 350\ \mu\text{m}</math> or better using 10x objective lens.</p>
6	<b>Cantilevers and probe tip</b>	<ul style="list-style-type: none"> <li>• Contact tip – 10 nos.</li> <li>• Non-contact tip – 10 nos.</li> <li>• Probe tip exchange should be very convenient without requiring special tools or head removal.</li> <li>• The AFM system should allow user to mount cantilever purchased from 3<sup>rd</sup> party.</li> <li>• Tool kit.</li> </ul>
7	<b>Computer</b>	<p><i>PC should be with below specification or better:</i></p> <ul style="list-style-type: none"> <li>• Intel iCore processor or compatible with the AFM system</li> <li>• 4 GB RAM, 2x 160 GB Hard Disc Drives</li> <li>• Dual LED monitors</li> <li>• Graphic Card: integrated video capture board for display of on-axis microscope camera on PC monitor.</li> <li>• Operating System: Microsoft Windows 7 Professional 32 bit (English)</li> </ul>
8	<b>Software</b>	<ul style="list-style-type: none"> <li>• The AFM system should have separate software for data analysis and measurement.</li> <li>• Able to perform multi-tasking with Windows based data acquisition, or equivalent and imaging processing programs at the same time.</li> </ul>
9	<b>Measurement Software</b>	<ul style="list-style-type: none"> <li>• Multiple data acquisition and display</li> <li>• F-d spectroscopy control</li> <li>• Adjusting feedback gain, set point, drive frequency /amplitude /phase in real time.</li> <li>• Seamless data transfer to the analysis software</li> <li>• The data acquisition software should be fool prove, which enable user to obtain topography images in less than 5 mouse clicks, without the need to setup set point, gains, and etc.</li> <li>• The system will start a topography measurement with optimized conditions for imaging automatically at the click of a button during Auto Mode.</li> </ul>
10	<b>Data analysis software</b>	<ul style="list-style-type: none"> <li>• Platform-independent software.</li> <li>• 'Copy to Clipboard' function for convenient presentation editing.</li> <li>• Running on Microsoft Windows.</li> <li>• The data should be able to be viewed in Top View, 3 D view, Z height colour, and etc.</li> <li>• Line view should also be done to perform line measurement.</li> <li>• Able to perform functions to include profile tracer, line measurement of height, line profile, power spectrum, average roughness, volume, surface area, grain analysis etc.</li> <li>• Copy to clipboard function for convenient presentation editing.</li> </ul>
11	<b>AFM Controller</b>	<ul style="list-style-type: none"> <li>• The AFM controller should come with a high performance processing unit within digital signal processing of 600 MHz and 4800 MIPS.</li> <li>• The electronic signal inputs should be at least 20 channels of 16 bit ADC at 500 kHz sampling.</li> <li>• The electronic signal outputs should be at least 21 channels of 16 bit</li> </ul>

		<p>DAC at 500 kHz settling.</p> <ul style="list-style-type: none"> <li>• Feedback frequency should be at least 500kHz.</li> <li>• Enables simultaneously acquisition up to 16 images.</li> <li>• Enable acquisition of image up to 4096 × 4096pixels.</li> <li>• The controller should be provided with at least one lock-in amplifier for advanced experiments</li> </ul>
13	<b>Warranty</b>	<ul style="list-style-type: none"> <li>• One year of comprehensive warranty for all the parts of the AFM system.</li> </ul>
14	<b>Performance Certificate from Users</b>	<ul style="list-style-type: none"> <li>• Vendor must provide at least 5 performance certificates.</li> </ul>

**Other Qualification Criteria:**

1. At least five user names and contacts from NIT/IIT/reputed Indian institute/Govt. R&D organizations must be provided where the above equipment and accessories (**Annexure-I**) have been supplied in last five years. Scan copies of the minimum five purchase orders of the above equipment and accessories (**Annexure-I**) must be enclosed along with the technical bid.
2. There must be a local maintenance center with availability of the spares in India.
3. Scanned copies of the technical brochure of the above equipment and accessories (**Annexure-I**) given in the quotation must be included in the technical bid.
4. Web references must be provided along with the technical bid.
5. Pointwise technical compliance along with any deviation of the mentioned specifications (**Annexure-I**) must be indicated along with technical documents.
6. Customized equipment and accessories (as per **Annexure-I**) will not be accepted. The standard equipment and accessories (as per **Annexure-I**) will only be accepted.
7. Make and model no. should be mentioned in the technical bid.

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