

UNIVERSITY OF HYDERABAD

*(A Central University established by an Act of Parliament, 1974)*

Prof. C. R. Rao Road, P.O. Central University Campus, Gachibowli,  
Hyderabad - 500 046, Telangana, INDIA website: [www.uohyd.ac.in](http://www.uohyd.ac.in)

*School: IoE (SEST)..... Department / Centre: NA.....*

*Telephone:04023137134(O) 9621059857(M). Email: [jaiprakashgautam@uohyd.ac.in](mailto:jaiprakashgautam@uohyd.ac.in).*

**Global Tender Enquiry No. UoH/IoE/ Multifunctional MicroXRD-01**

**Date: 25<sup>th</sup> August, 2022 (extended up to 25/11/2022)**

Sealed tenders are invited for supply of the following items under **two bid system** from the reputed manufacturers or their authorized dealers across the world to the University of Hyderabad, Hyderabad.

***Sealed bids should reach the office of the School of Engineering Sciences and Technology, University of Hyderabad, Hyderabad on or before 25/11/2022 (date) 5:00PM (time).***

The details of items, expected quantity and their technical specifications are given below:

Sealed tenders are invited by University of Hyderabad for the supply and installations of the **Complete Multifunctional Micro-XRD system along with necessary accessories** from the manufacturers or authorized dealers in Two Bid Pattern (*i.e.* technical & price bid in separate envelopes) as per Terms & Conditions stated in this Tender Enquiry. The tenders must reach Prof. Jaiprakash Gautam on or before **5:00 PM on 25/11/2022.**

**Tender Specifications**

**Introduction**

X-ray micro diffraction system with multi axis goniometer. The system should be featured which combine X-ray source with variable micro focus high brilliance beam. The system could have replaceable optics for thin film reflectivity/reciprocal space mapping/Rocking

curve precise measurements, and 2/4-bounce crystal analyzer at receiving side for high resolution. The system must fulfil the following requirements as a minimum.

### General

The required Multifunctional Micro-XRD system must be able to characterize a broad range of materials including conducting, magnetic, semiconducting, insulating solid materials in the form of bulk or powder or thin film.

### Required essential features

Sl. No.	Particulars	Required specifications
1	<b>Xray source with microfocus</b>	<ul style="list-style-type: none"> <li>X-ray generator to provide an X-ray beam with variable micro focus sizes keeping high brilliance.</li> </ul>
2	<b>Beam optics</b>	<ul style="list-style-type: none"> <li>Multilayer mirror optics and slits for multi-purpose applications</li> <li>Both primary and secondary beam optics must have feature of automatic changeover facility without much manual intervention.</li> </ul>
3	<b>Goniometer</b>	<ul style="list-style-type: none"> <li>Multi-axes attachment base and exchangeable various attachment heads. The Goniometer motor should be driven through synchronous DC or stepper motor for better accuracy and for fast step scan.</li> </ul>
4	<b>High resolution detector</b>	<ul style="list-style-type: none"> <li>High energy resolution</li> <li>It must be able to work in “0” dimension, “1” dimension, “2” dimension, scanning, static and fast scan modes</li> </ul>
5	<b>Applications</b>	<ul style="list-style-type: none"> <li>Thin film reflectivity Mapping application</li> <li>For mapping an X-Y stage with minimum 0.5 microns step with X-Y stage movement 20 mm or more couple with X-ray positioning on sample monitored using camera, microscope or laser guidance</li> <li>Reciprocal space mapping Rocking Curve measurement</li> <li>Residual stress analysis and trace elements</li> <li>Pole figure measurement and ODF analysis</li> <li>Grazing angle measurement</li> </ul>
6	<b>Computer hardware and Software</b>	<ul style="list-style-type: none"> <li>The advanced computer hardware and software for controlling the system for guiding procedures and conditions of the measurements as per user’s requirement. Depending on the measurement purposes, the structure and condition of optic guidance for the proper configuration to perform a</li> </ul>

		measurement under the appropriate condition after completing the alignment of optics and sample positioning.
7	<b>Warranty</b>	<ul style="list-style-type: none"> <li>Comprehensive warranty for minimum 5 years.</li> </ul>

### Technical specifications (Essential features)

Sl. No	Particulars	Required specifications	Your specs*
1	Xray Microfocus Source	<ul style="list-style-type: none"> <li>Target should be copper</li> <li>Effective beam size at focal point should be less than 100x100 microns.</li> <li>Minimum beam divergence should less than 0.08°</li> <li>Brilliance output ~5kW/mm<sup>2</sup> or better at the spot size of 100 microns</li> <li>K<sub>beta</sub>/K<sub>alpha</sub> rate less than 0.5 %</li> <li>Voltage should be 20-40 KV or more in steps of 1KV or less and current up to 4mA or more</li> <li>Stability of X-Ray source should be within +/- 0.01 for 10% main fluctuations.</li> <li>All the standard safety features.</li> </ul>	
2	Goniometer	<ul style="list-style-type: none"> <li>Geometry should be theta /theta with horizontal/vertical sample mounting with measuring circle diameter of 600 mm or more</li> <li>Minimum step width: 0.0001deg of the goniometer</li> <li>Scanning range: ~3 deg. ~140deg (2θequivalent)</li> <li>Additional- Add on attachment Chi-Phi Eulerian cradle and stages</li> <li>In-plane arm should be possible for 2θ scanning range 0 to 120° or more</li> </ul>	
3	Incident optics	<ul style="list-style-type: none"> <li>Multi-purpose incident optical systems with Standard multi mirror with options of detachable optics</li> <li>Collimator holder with various diameter: 0.05mm, 0.1 mm, 0.2 mm and 0.3 mm specifying the minimum flux 1x10<sup>9</sup>Counts per second</li> <li>Sample spot size should be variable with range of minimum 50 microns and maximum 300 microns with guaranteed useful data in the exposure time of one hour.</li> <li>2 Bounce Crystal monochromator with auto alignment</li> <li>Parallel slit attaching mechanism</li> </ul>	
4	Receiving optics	<ul style="list-style-type: none"> <li>2 Bounce Channel cut analyzer</li> <li>Necessary slits and plates</li> <li>Motorized rotation adjustor</li> <li>Automatic attenuator for Cu required for XRR and grazing angle applications</li> </ul>	

5	Detector	<ul style="list-style-type: none"> <li>• With different operating mode, 1D and 2D with count rate <math>10^7</math> or better</li> <li>• Large area detector with best available energy discriminator 4 to 20 keV or better</li> <li>• High energy resolution</li> <li>• Spatial resolution 100 microns or less</li> <li>• Low angle background stopper or direct beam stop</li> <li>• Compatible Computer controlled slit and accessories should be able to filter fluorescence and white radiation from the diffracted beam.</li> <li>• Detecting area 70×35 mm or more</li> <li>• Pixel size 100 x100 micron or less</li> <li>• Linear count more than 1,000,000 cps/pixel</li> <li>• Counting efficiency more than 95% (Cu K-Alpha)</li> </ul>	
6	Sample stage and monitor	<ul style="list-style-type: none"> <li>• Glass and aluminum sample holder for powder and bulk samples</li> <li>• Zero background sample holder may be added</li> <li>• High resolution and magnification with options like CCD camera and laser video microscope</li> </ul>	
7	Measurement application software	<ul style="list-style-type: none"> <li>• The control software for controlling the system as it conventionally does, but also for guiding procedures and conditions of the measurements users required. Depending on the measurement purposes, the structure and condition of optics</li> </ul>	
8	Standard Software	<ul style="list-style-type: none"> <li>• For easy work performance such as changing samples and exchanging optics, the special consideration was made on the design for the proper goniometer installation position and the shape of the radiation enclosure housing so that users can exchange them without any difficulty. Change of the system configuration that required due to the change of the measurement purpose can easily be done using only one type of the tool.</li> </ul>	
9	Computer hardware and software	<ul style="list-style-type: none"> <li>• The system should be controlled automatically for all the Parameters as per tender specifications however in case of computer system failure the manual override must be available. It should be equipped with the current generation with PC with 64 bit and 27 inch LED monitor with latest hardware configurations and windows operating system for example I-7 processor, 16GB RAM, 1TB SDD or more, 4GB Graphics Card, Window 10 Professional, Windows Office, which supports the software and smooth operation of Micro-XRD and other</li> </ul>	

		attached systems must be included. The supplier should upgrade the software free of cost whenever they are available.	
	Calibration standards	<ul style="list-style-type: none"> <li>• Supplier must provide license software for the complete XRD operation including option to make changes manually.</li> <li>• The system must have ability to be controlled remotely via internet/network.</li> <li>• There must be at least 3 numbers of data processing software user licenses (or dongles) for XRD analysis through peak identification using the library and peak fitting.</li> <li>• The latest version software must be provided with free update. The hardware should also be latest window-based system.</li> <li>• The Handbook of XRD analysis (hard copy) is necessary and should be provided along with instrument supply.</li> </ul>	
	Consumables	<ul style="list-style-type: none"> <li>• Standard samples must be provided to check the system calibration, resolution, sensitivity, etc.</li> </ul>	

**Price quote (Essential features/items)**

<b>Sl.No.</b>	<b>Particulars</b>	<b>Best offer price (Indian Rupees)</b>
1	Basic model-Micro XRD	
2	Monochromator	
3	Goniometer	
4	Goniometer -add on attachments	
5	Optics	
6	Detector	

7	*Any other item	
8	Optional for in person on-site maintenance (minimum 3 years)	
9	Other accessories (Chiller, compressor, UPS, PC/Printer etc.)	
10	Consumables required to run the system for at least 5 years.	
11	Manuals	
12	Installation/training	
13	Packing/Shipping	
14	Educational discount	
15	Packing (if any)	
16	Final price (FOB)	
17	Freight	
18	Insurance (if any)	
19	Final price (CIP, Hyderabad)	

\*If included in the basic model, indicate this clearly

#### **Warranty**

- Comprehensive Warranty for 5 years for entire system including all the attachments (such as UPS, chiller and compressor or any other third-party component) of the system from the date of installation and commissioning.
- Service response must be within 48 hr. If service engineer fails to attend the complaint within 10 days, the warranty of the machine will automatically be extended for same number of days
- The cost for additional TWO years of warranty and/or AMC after five years of warranty should be Mentioned

#### **Manuals**

A complete set of instruction and service manual must be provided along with the system. The wiring and circuit diagrams should also be provided.

#### **Installation and training**

- After installation by the engineers of supplier, the system performance must be demonstrated to the customer's satisfaction as per the specification detailed here.
- The supplier must provide basic training to the users for at least five days after completion of installation.
- A follow-up training must be provided by the supplier's engineer after six to nine months of installation.

### Pre-installation Requirements

Pre-installation requirements such as room size, EM tolerance limits, and vibration limits should be mentioned and verified by the supplier at the installation site as soon as PO is issued

### Additional Terms

The firm has to guarantee technical support for the entire system and supply of spares for a minimum period of 10 years from the date of installation.

- Service response time must be <48 hours.
- Provision for on-line remote diagnosis of faults.
- The firm must have at least **three** installations of similar equipment within India to establish desired competence for maintenance.
- List of users with copies of installation report and contact details (address and phone number) of the users, where instrument has been supplied in last three years should be provided.
- Date of manufacturing of the equipment should be after the placement of order.
- Original documents from the manufacturer supporting the specifications should be provided.
- A detailed compliance statement indicating point-wise response of the vendor to every item in the specifications, optional items as well as terms should be provided.
- Price-bid should have every item mentioned in technical bid.

### Further information that should be provided

1. Warranty on the main equipment and accessories; **minimum 5 years is essential** from the date of installation. If any component of the equipment quoted is not covered by the warranty, the same must be specified.
2. Spare parts / calibration samples supplied with the equipment
3. Training provided at the time of installation
4. Utility and installation requirements
5. Support for on-site service of equipment
6. List of current users (with contact numbers) of the quoted model in India
7. Quotation validity (should be at least 90 days)
8. Time required for delivery of equipment after firm order; should be <90 days

### Terms & conditions

S. No.	Clause	Description
1	Reference Number	The Reference No. <b>UoH/IoE/ Multifunctional MicroXRD-01</b> of the Notice Inviting Tender dated 25/08/2022 should be clearly mentioned on all envelopes and any correspondence including e-mails with the University.
2	Mode of submission	Hand-written (manuscript) bids and bids submitted through e-mail shall not be accepted. All pages of the tender document must be signed by the authorised representatives of bidder, in token of having accepted the terms and conditions incorporated in the tender notice.
3	Two Bid System (This clause is applicable only)	As the purchase is a high value plant, machinery, etc., of a complex and technical nature, bids are required to be submitted in two parts as under:

	when NIT is invited involving two bid system)	<p><b>(i) Technical bid consisting of all technical details along with commercial terms and conditions; and</b></p> <p><b>(ii) Financial bid indicating item-wise price for the items mentioned in the technical bid.</b></p> <p>The technical bid and the financial bid should be sealed by the bidder in separate covers duly super-scribed and both these sealed covers are to be put in a bigger cover which should also be sealed and super-scribed. The technical bids are to be opened by the Purchasing Department / Centre at the first instance and evaluated by a duly constituted Purchase Committee. After such evaluation of technical bids, financial bids of only those firms/suppliers which are found technically suitable will be opened, for determining the lowest bid.</p>
4	Certificate from original manufacturers	<p>If the bid is not from the original equipment manufacturer, the suppliers/dealers should submit an 'authorized agency certificate' from the manufacturer. Tenders received without Authorization Certificate from the original manufacturer will summarily be rejected.</p> <p>Imported purchases should normally be made directly from the foreign principal manufacturers. In the event of purchase made through an Indian agent of the foreign company, authorization letter issued by the foreign company / manufacturer should be submitted along with technical bid. No commission shall be payable to Indian Agent.</p>
5	Make and Model	<p>The Vendor/Supplier is required to clearly mention the make, model, size and other specifications along with the unit price. Items with better specifications may also be offered / quoted and the decision of the University in this regard is final. Appropriate brochures / pamphlets / literature (original and not photo copies) for each item providing full technical details must be attached to enable their verification.</p>
6	Bidder Details	<p>The bidder's complete correspondence address, phone numbers and e-mail ids, and website details (if any), must be clearly mentioned in the technical bid documents. (Pamphlet / Brochure depicting the profile and organisation structure may be enclosed.) The details of PAN, GSTIN, EPF, ESIC, Registered License Certificate, Labour License etc., may be mentioned and supporting documents shall be enclosed along with the technical bid.</p>
7	Validity of bids	<p>Prices quoted in the bid (financial bid) shall be valid for a minimum period of 90 days from the date of opening of the financial bids. No upward revision of the prices will be permitted during the said validity period.</p>



8	Basic Price	The bidder should clearly indicate price per unit on FOR, UoH, Hyderabad basis. In respect of imported items, the prices should be quoted on the basis of CIP / CIF Hyderabad.
9	Taxes: GST& Customs Duty	As per Government of India rules.
10	Other costs / charges	The bidder should clearly indicate all applicable other charges, if any, separately viz., transportation, packing, loading, unloading, insurance, installation, commissioning, testing, training, etc.,
11	EMD	The bidders may note they are required to submit Earnest Money Deposit EMD @ 3.5 % the basic cost of the instrument /equipment excluding insurance and freight charges. The amount of EMD may be submitted in the form of account payee demand draft, Fixed deposit receipt, Banker's cheque or bank guarantee from any commercial bank drawn in the favor of Finance officer, UoH.
12	Warranty	The bidders should offer a minimum period of 5 years warranty for all the quoted items from the date of successful installation of the equipment/ item. The quoted price shall be inclusive of warranty costs. AMC/FMC charges for fourth and fifth year shall be quoted separately, if applicable.
13	Comprehensive Annual Maintenance Contract (CAMC)	Bidders shall quote Comprehensive Annual Maintenance (CAMC) charges for a period of 2 years after expiry of the initial warranty period of 5 years. In all other cases, rate for at least three years' CAMC be quoted.
14	Agreement	An Agreement in the format prescribed by the University of Hyderabad is required to be entered into by the Suppliers or their authorized Representative with the University in respect of purchase of Goods / Services valuing Rs. 10 lakh and above, within a period of 15 days from the date of issue of Purchase Order / Work Order. In cases of CAMC, agreements are to be entered into on case-to-case basis duly customizing the format of agreement. In cases of works awarded by University Works Department, template of agreement finalised by Internal Audit Office, UoH is to be adopted.
15	Performance Security / Performance Bank Guarantee	Successful bidder should submit a Performance Security (in all cases of purchases valuing above Rs. 10 lakhs in the form of Performance Bank Guarantee for an amount equivalent to 3% of the total basic price of the Goods / Services (exclusive of taxes and duties) within a period of 15 days from the date of issue of Purchase Order/ Work Order.

		<p>Performance Security should remain valid for the entire warranty period plus additional (grace) period of 60 days, from the date of successful installation of the equipment/item.</p> <p>Performance Security shall be submitted in the form of Account Payee Demand Draft / Fixed Deposit Receipt / Banker's Cheque / Bank Guarantee from any of the Commercial Banks in an acceptable form, drawn in favour of Finance Officer, University of Hyderabad, payable at Hyderabad.</p>
16	Payment	In case of purchases from foreign manufacturers/suppliers, Letter of Credit (LC) will be opened for 100% of the purchase value and <b>97</b> % shall be released after signing the Agreement and shipment / submission of documents. As regards balance payment, it will be released on submission of PBG for equivalent amount (in Indian currency) or completion of the warranty period as per the terms included in the NIT and Purchase Order.
17	Delivery Location	The items shall be delivered to: Department / Centre: IoE Instrument Cluster School: IoE -SEST. University of Hyderabad, Gachibowli, Hyderabad - 500 046, India
18	Delivery Period	The supplier should be able to deliver the items within 90 days ( <i>mention the required delivery period by the proposer</i> ) from the date of issue of the purchase order.
19	Liquidated damages for late Delivery	In the event of delay in delivery beyond stipulated period indicated in the Purchase Order, liquidated damages @ 1% per each week of delay subject to a maximum of 5% of the cost of the order will be levied and collected by the University, by way of deduction from the payments due to the vendor/supplier.
20	Risk Purchase Clause	If the Supplier fails to deliver the ordered materials within the stipulated delivery period specified in the Purchase Order, the University may resort to procure such items and in such a manner as deemed appropriate, goods or services similar to those undelivered, and the Supplier will be liable to reimburse the University for any excess costs for such similar goods or services.
21	Right to reject	The University reserves the right to reject any or all the bids or accept a part of the quotation without assigning any reasons therefor. The decision of the University in this regard is final and binding on all the suppliers.
22	Resolution of Disputes	Any disputes arising out of this contract shall be referred to the University, and if any of the parties hereto is dissatisfied with the decision, the dispute shall be referred to the decision of the Arbitrator, who should be acceptable to both the parties, to be appointed by the Vice-Chancellor of the University. The decision of such Arbitrator shall be final and binding on both the parties.
23	Jurisdiction of Courts	Disputes, if any, arising during course of execution of the order are to be settled within the jurisdiction of Hyderabad / Ranga Reddy District Courts only.

24	Opening of tenders / bids	The bids will be opened in the office of IoE finance committee, University of Hyderabad, Hyderabad on 28/11/2022 (date) at 4:00PM (time) in the presence of bidders or their authorized representatives. The authorized representative shall bring the authorization letter and submit the same to the University before opening of bids. On failure to do so, the Representative loses the right to participate in the bid opening process.
25	Delay in submission	The University will not in any way be responsible for any postal / courier delay. Bids received beyond the stipulated date and time of submission are summarily rejected. Tenders incomplete in any respect will be summarily rejected.
26	Due date of submission of bids	Sealed Bids should be submitted to the office of SEST, University of Hyderabad, Gachibowli, Hyderabad - 500 046 on or before 25/11/2022 (date) 5 PM (time). Bids received thereafter shall not be considered.

**Signature of Faculty In-charge**  
**Prof. Jaiprakash Gautam**  
**School of Engineering Sciences and Technology**  
**University of Hyderabad, Prof. C. R. Rao Road,**  
**Gachibowli, Hyderabad 500 046, Telangana, India**  
**Mobile:9621059857**  
**E-mail ID: jaiprakashgautam@uohyd.ac.in**