Notice Inviting Open Tender for:
Supply, Installation, Commissioning & Training for Precession-enhanced 4D-Scanning Transmission Electron Diffraction (4D-STEM) system to be installed in Titan Themis (probe corrected electron microscope) housed at AFMM, Indian Institute of Science, Bangalore - 560012

(Global tender)
Bids are invited from Global OEM / authorized distributor of Global OEM
(Last date of Submission Dec 24, 2025)

1	Section 1	Bid Schedule	
2	Section 2	Eligibility Criteria	As specified by IISc
3	Section 3	Terms and Conditions	As specified by IISc
4	Section 4	Specifications	Technical specifications
5	Section 5	Technical Bid	Annexure 1: Bidder details
			Annexure 2: Declaration regarding experince of bidder
			Annexure 3: Declaration regarding clean track record of the bidder
			Annexure 4: Declaration of acceptance of tender
			Annexure 5: Terms and conditions. Details of item quoted
6	Section 6	Commercial bid	Quotation with Price, Technical specifications of the Equipment
7	Checklist		

Date: Dec 3, 2025

Please send your tender documents valid for 180 days from the actual date of opening the technical bid, for the supply of equipment described below. Your documents/quotation should clearly indicate the terms and conditions of the quotations, delivery schedule, entry tax, payment terms, warranty coverage, etc. The tender should be submitted in two separate sealed envelopes – one containing the "Technical bid" and the other containing the "Commercial bid", both of which should be duly signed and must reach the undersigned on or before 17:00 hours December 24, 2025. Please provide your contact details so that we can get in touch with you and set up appointments to open the bids.

The primary interest of the AFMM is the procurement of **a Precession-enhanced 4D-Scanning Transmission Electron Diffraction (4D-STEM) system to be installed in Titan Themis (probe-corrected electron microscope) housed at AFMM, Indian Institute of Science, Bangalore.**

The camera should be installed by replacing the currently available Ultra-Scan camera in the microscope. Installation of the new CMOS camera should not disrupt other functionalities of the

microscope, such as various modes of STEM imaging, HRTEM, conventional diffraction, EDS, and EELS.
The new camera should have a CMOS sensor capable of collecting high-resolution images and videos during operation in TEM, STEM, and EELS modes.
The pricing for the camera must be a stand-alone purchase, and as a bundle purchase, it should be clearly indicated in the financial bid.

Mailing Address:

The Convener,
Advanced Facility for Microscopy and Microanalysis (AFMM)
Indian Institute of Science,
Bangalore 560012,
Karnataka, India.

Email Addresses:
office.afmm@iisc.ac.in
Cc: rajeev@iisc.ac.in

Section 1 - Bid Schedule

1	Tender No	AFMM-TITAN-SPED-1
2	Item Description	a Precession-enhanced 4D-Scanning Transmission Electron Diffraction (4D-STEM) system to be installed in Titan Themis (probe-corrected electron microscope) housed at AFMM, Indian Institute of Science, Bangalore.
3	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
4	Place of tender submission	The Convener, Advanced Facility for Microscopy and Microanalysis (AFMM) Indian Institute of Science,
5	For further clarification	The Convener, Advanced Facility for Microscopy and Microanalysis (AFMM) Indian Institute of Science, Bangalore 560012, Karnataka, India. Email: office.afmm@iisc.ac.in

Section 2 - Eligibility Criteria:

Pre-Qualification criteria:

A) Equipment offered must be a model from the current serial production range of the manufacturer. Customized or One-off Manufactured Model will not be accepted. Offer should be supported with printed catalogue / depiction on company website.
B) The local vendor of OEM must have supplied this system in India to reputed institutions (as attachments to TEMs). Please attach a reference list of supplies in last 2 year with contact details (Name, Phone, email address) of users.
C) The company should be original equipment manufacturers (OEMs). Please attach exclusive authorization certificate(s) specific for this tender with quote without which bid will be rejected.
D) The manufacturer must be an ISO9001 company & equipment model must be with CE compliance. Please attach relevant certificates.
E) The Bidder's firm should have existed for a minimum of 5 years. (Enclosed Company Registration Certificate)
F) The Bidder should have qualified technical service personnel for the instrument(s) based in India.
G) If the Bidder is a local distributor/dealer/Agent, attaching an authorization certificate with the technical bid from the original equipment manufacturer is mandatory.
H) The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 1.
I) The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.
J) Only the Original Equipment Manufacturer or their authorized representatives shall participate in the bid.
K) The order will be placed only on the bidder who participated in the bid.

SECTION 3 – Technical Specifications:

System specifications

- The solution should be able to add a continuous precession movement to the electron beam in order to obtain higher-order reflections, mitigate dynamic effects, and eliminate Kikuchi lines.
- The precession half angle must be greater than 1.4° (with respect to the optical axis) configurable, and reproducible.
- The accessory must allow precession over a full 360° rotation.
- The precession frequency must be at least 100 Hz, at a precession angle of 0.6°.
- Beam scanning and precession must be hardware and software synchronized for 4D-Scanning Precession Electron Diffraction (4D-SPED) data acquisition, with no perceptible drift over the duration of an acquisition (beyond normal sample drift).
- The solution should work with probe-corrected and non-corrected TEMs. A beam compensation function should be implemented that partially compensates for additional beam broadening,
- While scanning an area, the hardware should keep the average angle of the incident beam constant over the whole area.
- The system should be capable of performing descanning / deprecession by hardware, without requiring user intervention or software-based correction / summation of the diffraction patterns as a function of the precession angle.
- The system must allow the recording, recall, and management of multiple sets of alignment parameters (different TEMs, operating modes, acceleration voltages, etc.) with configuration traceability.
- The system should have the possibility to work with TEM columns from various suppliers.

- It should be possible to combine the system with optical and/or direct detection cameras, either through the supplier itself or from other parties, allowing the user to freely choose from a range of robust detectors optimized for the precession-enhanced 4D-STEM experiment.
- The system should allow for shared use between different TEMs in the same building (TEM column compatibility dependent).
- The solution provider should give a list of at least 20 earlier installations.
- Interface with the Titan Themis should be seamless, and is a complete responsibility of the vendor.

Software specifications

The provider should be able to offer menu-driven, properly documented software to cover the full work flow from data collection to analysis for the following applications

1. Data acquisition software
    - ☐ It should allow for simultaneous synchronization of TEM beam scanning and beam precession to acquire a series of Precession Electron Diffraction (PED) patterns for all applications mentioned below.
    - ☐ It must provide the capability to generate virtual STEM, Bright-Field (BF), and Dark-Field (DF) images directly from the acquired diffraction data.
    - ☐ Users shall be able to define the scanning area over a pre-acquired VDF image.

2. Orientation and Phase Mapping
    - ☐ The software should be capable of creating Orientation/Phase maps by comparison with simulated electron diffraction patterns, automatically generated from any crystal system.
    - ☐ The minimum grain size for which the orientation can be determined reliably can be below 3-4nm for a TEM equipped with a Field Emission Gun.
    - ☐ The software should be capable of generating virtual Bright Field/Dark Field images from the acquired data using with user defined apertures, and add or subtract them in order to highlight specific features.
    - ☐ It should be possible to generate cross-correlation maps for observing sample details like grain thickness variation, thickness of domain boundaries, grains overlapping, three dimensional details.
    - ☐ The software should have functionality for creating grain boundaries maps including special boundaries (e.g. twins identification)
    - ☐ The software should be able to determine grain size distribution
    - ☐ The software should offer pole figure visualization for texture analysis.
    - ☐ The software should be capable of dealing with ambiguities in the determination of orientation
    - ☐ An interpolation algorithm for high angular resolution (up to 0.3^{o}) should be present
    - ☐ The software should be able to deal with overlapping grains and precipitates-matrix systems.
    - ☐ It should be possible to overlay chemical information data from EDX with the phase map.
    - ☐ Export to appropriate data formats should be available to allow for additional analyses using third-party Electron Back Scatter Diffraction (EBSD) software.
3. Electric Field Mapping using precession to allow for an accurate determination of the shift of the transmitted beam
    - ☐ Data processing should be performed using a user-friendly software that includes Centre of Mass (COM) algorithms for beam deflection calculation
    - ☐ Automated correction of beam shifts due to scanning.

- ☐ The software must provide automated generation of beam deflection (offset) maps in milliradians, visualized as color-coded electric field maps using a reference colour wheel to indicate field direction.
- ☐ it should allow automated extraction of Apparent Electric Field (MV/cm) and Apparent Potential (V) profiles along selected lines or averaged regions of interest.
- ☐ Spatial resolution will be comparable to the probe size.

4. Software for preparing electron diffraction data for solving crystal structures
   - ☐ The software should provide a comprehensive solution for reciprocal space reconstruction from 3D Electron Diffraction (ED) Tomography data.
   - ☐ It should enable automatic determination of unit cell parameters, indexing of reflections, and extinction symbol detection for space group identification, ensuring a complete and efficient workflow from data acquisition to structure solution.
   - ☐ Data acquisition should be based on precession electron diffraction (PED) patterns collected during manual sample tilting within the TEM tilt limits (typically from –30° to +30° in 1° angular steps with a precession angle of 1°).
   - ☐ The reconstructed reciprocal space should be automatically visualized with 2–3% accuracy in unit cell parameter determination and allow users to identify crystallographic effects such as twinning and disorder.
   - ☐ The software module must also support extraction of diffraction intensities suitable for structure analysis, generating HKL and intensity files compatible with standard crystallographic software (e.g., SIR2014, SHELX) for accurate 3D atomic structure solution.

Optional Items for future upgradation:

1. Strain Analysis
   - ☐ Capable of processing electron diffraction maps with strained and unstrained areas. The software should be able to determine strain values down to 0.02% precision and 0.02% accuracy when a precession angle of 1º and a convergence semi-angle of 1.2 mrad are used during data collection. The achievable spatial resolution should be below 3 nm for a TEM equipped with a Field Emission Gun and a Probe Corrector.
   - ☐ It should be possible to extract strain profiles from an area of interest, either along a line or as an average over a selected region.

2 Short range order mapping analysis of amorphous and nano-crystalline materials (electron Pair Distribution Function Analysis)
   - ☐ Data processing should be carried out using an easy-to-use software platform offering comprehensive tools for analysis and visualization.
   - ☐ The software must support masking of the beam stopper and inactive detector areas, and perform automated, high-accuracy localization of the diffraction pattern center.
   - ☐ It should enable azimuthal integration for each pixel across the full dataset, conduct ePDF calculations from individual pixels, and generate a corresponding ePDF map representing spatial variations in atomic pair distributions.
   - ☐ The software should also allow ePDF simulation from a CIF file and provide automated determination of interatomic distances derived from the CIF-based structural model for accurate structural correlation.
   - ☐ Spatial resolution should be comparable to the probe size

NOTE / Pre-Qualification criteria:
The manufacturer must be an ISO9001 company & equipment model must be with CE compliance. Please attach relevant certificates.

ADDITIONAL REQUIREMENTS:

1. List of other installations in India with contact details of scientist / individual in-charge.
2. The technical specifications listed above are a minimum indicative. The ease of operation and maintenance, the ability to integrate latest technology, and after sales service facilities are some of the key factors in the evaluation process.
3. **The details, credentials, and experience of individuals who are factory trained service engineers of the quoted model and is currently on roll in India or at the nearest service hub should be submitted with the offered quotation.**
4. Quotation should include all cost including logistics required to complete the installation at IISc.
5. The Vendor should certify and confirm availability of spares, service support and, both hardware and software upgradation for at least 10 years from the year of installation.
6. Any equipment of component procured locally and supplied with the instrument should be quoted in Indian Rupees.
7. List of select user laboratories of an instrument of similar configuration and scientific application must be provided with the contact details (e-mail) of the person-in-charge of the instrument, model and date of installation.
8. IISc may opt for demonstration of any technical specifications and performance of the quoted model on the samples provided by us, at any available user site in India or at the factory / preferred demonstration site for the company, as a part of technical evaluation.

Section 4–Terms and Conditions:

1. The tender document should be in English and be submitted in **two bid system, i.e., Technical bid, and Commercial bid in two sealed envelopes with commercial or technical bid clearly indicated on the envelope.** These two sealed envelopes should be placed within a larger sealed envelope.
2. The technical bid must include all details of technical specifications of the instrument along with commercial terms and conditions masking only the price component. Bill of materials, brochures, technical datasheets, and any other document may be enclosed to help the evaluation of the technical bid. Please also include warranty terms and any other information on upgradation terms/extra accessories in the technical bid.
3. The technical bid must clearly state the specifications of the main instrument (A) along with the accompanying standard items and all other details including the warranty terms (B-I) as specified in section 3 of this document.
4. The commercial bid must include the base price of the instrument, optional additions plus all components including accessories, and taxes.
5. The commercial bid must indicate detailed component-wise and itemized price breakup and must include optional items/accessories.
6. Bidder should have well established own establishment. Enclose company registration certificate, PAN, 3 years of audited balance sheets and turnover.
7. In the technical bid include the complete details all components of the main instrument and the accessories as to whether they are sourced locally or foreign made/imported along with the manufacturer and sourcing details.

8. The vendor should have a good track record of having previously supplied similar equipment in India or elsewhere in the world (Please furnish complete details including names and contact addresses). Reference letters may be sought by the committee to arrive at the decision.
9. The vendor should have qualified technical service personnel for the instrument based in Bengaluru.
10. Bidder should have executed at least three order of similar instrument in India in the last 2 years. (Please provide copy of purchase orders and details).
11. The bidder should provide a list of national and international publication resulting from the data of the instrument.
12. The Bidder should not be currently blacklisted by any institution, bank in India or abroad (Please provide self-declaration).
13. No advance payment will be made, the payment will be made after delivery and installation of equipment.
14. Agency commission (not encouraged) if any should be clearly mentioned and detailed in the commercial bid.
15. The lead time for the delivery of the equipment should be less than two months from the date of receipt of purchase order and must be mentioned in the technical bid.
16. If the equipment or any parts/accessories are found to be defective, they must be replaced or rectified at the cost of the supplier within 30 days from the date of receipt of written communication from us. If there is any delay in replacement or rectification, the warranty period needs to be extended by a year and/or face a penalty equal to the valuation of the equipment.
17. The technical bid will be opened first and evaluated.
18. Bidders meeting the required criteria as stated in Sections 2 and 3, of this document as well as the terms and conditions shall only be considered for Commercial Bid opening. Further, agencies not furnishing the documentary evidence as required will not be considered.
19. Following the opening of technical bid, a presentation may be sought from the bidder.
20. During the warranty period, the bidder shall be fully responsible for the manufacturer's warranty in respect of proper design, quality, and workmanship of all the systems supplied. If there is any delay in replacement or rectification, the warranty period needs to be extended by a year and/or face a penalty equal to the valuation of the equipment.
21. During the warranty period, the bidder shall attend to all the hardware problems on site and shall replace the defective parts at no extra cost to the purchaser.
22. The bids should be valid for at least 180 days from the last date of submission of the quotation.
23. The decision of the purchase committee will be final.
24. IISc, Bangalore reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time to award of construct without thereby incurring any liability of the affected bidder or bidders.
25. Tender documents that do not satisfy the "Terms and Conditions" listed herein will be disqualified.
26. Order will be placed on lowest bid from technically qualified vendor.
27. All the attached annexures should be signed and enclosed with the technical and commercial bids
28. The tender documents should be sent to the following address no later than 24/December/2025 5:00 PM IST.

    The Convener,
    Advanced Facility for Microscopy and Mircoanalysis (AFMM)
    Indian Institute of Science,
    Bangalore 560012,
    Karnataka, India

Annexure-1:

Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Details of the Bidder

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name

Designation, Seal Date:

Annexure-2:

Declaration regarding experience

To,

The Convener,
Advanced Facility for Microscopy and Mircoanalysis (AFMM)
Indian Institute of Science,
Bangalore 560012,
Karnataka, India

Ref: Tender No: XXXXXXXXX
Dated: XXXXX

Supply, Installation, Commissioning & Training of a High-resolution Field Emission SEM with optional dual large EDS detector and mineral/resource mapping facility at the Indian Institute of Science, Bangalore

Sir,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has ---- years of experience in supplying and installing the equipment mentioned in the Tender.

(Signature of the Bidder)
Printed Name
Designation, Seal Date:

Annexure-3:

Declaration regarding track record

To,

The Convener,
Advanced Facility for Microscopy and Mircoanalysis (AFMM)
Indian Institute of Science,
Bangalore 560012,
Karnataka, India

Ref: Tender No: XXXXXXX
Dated: XXXXX

Supply, Installation, Commissioning & Training of a High-resolution Field Emission SEM with optional dual large EDS detector and mineral/resource mapping facility at the Indian Institute of Science, Bangalore

Sir,
I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company/ firm is not currently debarred /blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted / debarred by Government / Semi Government/Organizations /Institutions	Reason	Since when and for how long

(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully
(Signature of the Bidder)

Name
Designation, Seal

Date:

Annexure – 4:

Declaration for acceptance of terms and conditions

To,

The Convener,
Advanced Facility for Microscopy and Mircoanalysis (AFMM)
Indian Institute of Science,
Bangalore 560012,
Karnataka, India

Ref: Tender No: XXXXXX
Dated: XXXX

Supply, Installation, Commissioning & Training of a High-resolution Field Emission SEM with optional dual large EDS detector and mineral/resource mapping facility at the Indian Institute of Science, Bangalore

Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)
Name
Designation, Seal Date:

Annexure – 5:

Details of items quoted:

a. Company Name
b. Product Name
c. Part / Catalogue number
d. Product description / main features
e. Detailed technical specifications
f. Remarks

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.

Section 6 – Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned under:

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Essential items noted in the technical specification				
1.a	… (details of essential items)				
1.b	…				
2.	Optional items noted in the technical specification				
2.a	… (details of essential items)				
2.b	…				
3.	Accessories for operation and installation				
4.	All Consumables, spares and software to be supplied locally				
5.	Warranty (3 years)				
6.	AMC 2 years beyond warranty				
7.	Cost of Insurance and Airfreight				
8.	CIP/CIF IISc Bengaluru				

Any additional items

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total

Section 7 – Checklist

(This should be enclosed with technical bid- Part A)
The following items must be checked before the Bid is submitted:

1. Sealed Envelope "A": Technical Bid

1. Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:
    a. Annexure 1: Bidders details
    b. Annexure 2: Declaration regarding experience
    c. Annexure 3: Declaration regarding clean track record
    d. Annexure 4: Declaration for acceptance of terms and conditions
    e. Annexure 5: Details of items quoted
2. Copy of this tender document duly signed by the authorized signatory on every page and sealed.

2. Sealed Envelop "B": Commercial Bid

Section 6: Commercial Bid

Your quotation must be submitted in two envelopes: Technical Bid (Envelope A) and Commercial Bid (Envelope B) super scribing on both the envelopes with Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date.