

Request for Quote for the procurement of a Microscopy system combining biological imaging and quantum sensing (last date: April 18, 2022)

This is a Request for Quote (RFQ) for the procurement of scientific grade **Microscopy system combining biological imaging and quantum sensing**, for the Centre for Nano Science and Engineering (CeNSE) at the Indian Institute of Science (IISc), Bangalore. IISc is India's best institution on higher learning and the Center for Nano Science and Engineering (CeNSE) is home to one of the best academic fabs in the world.

Procedure:

1. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. The technical bid should contain all commercial terms and conditions, except the price. **Only vendors who will be adjudged by the committee to meet the technical requirements will be considered for the commercial negotiation.**
2. **The deadline for submission of proposals is the April 18th, 2:00 pm Indian Standard Time.** Proposals should arrive at the Main office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, on or before the above deadline.
3. C.I.P. Bangalore basis (by Air Freight only). The quotation should mention the terms of delivery, delivery schedule, estimated delivery date, and payment terms.
4. The decision made by the purchase committee is final.
5. **The technical bid** must contain a point-by-point technical compliance document.
 - a. The technical proposal should contain a compliance table with 5 columns.
 - First column must list the technical requirements, in the order that they are given in the technical requirements below.
 - The second column must provide specification of the instrument against the requirement (please provide quantitative responses wherever possible)
 - The third column should describe the compliance with a "YES" or "NO" only. Ensure that the entries in the column 2 and column 3 are consistent.
 - The fourth column should clearly state the **reasons/explanations/context** for deviations if any. Without clear explanation, just stating YES" or "NO" will not be considered.
 - The fifth column may contain additional remarks. It can be used to highlight the technical features, qualify response of previous columns, or provide additional details.
 - b. Technical capabilities of any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.

- c. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
 - d. Relevant technical datasheets should be provided. The committee reserves the right to cross-check the information in these datasheets with publicly available information.
 - e. Items in addition to that listed in the technical table that the vendor would like to bring to the attention, such as data sheets, technical plots etc. can be listed at the end of the compliance table. Vendors are also encouraged to highlight the advantage of their tools over comparable tools from the competitors.
 - f. If multiple systems can fulfil the requirements, vendors can submit multiple bids.
6. The technical proposal will be evaluated against the technical requirement. Deviations from the technical specifications requested are allowed. Such deviations must be highlighted and justified. Their acceptance or rejection will be left to the discretion of the technical committee. Only the vendors, adjudged by the committee to be suitable to meet the technical requirements, will be considered for the commercial negotiation.
7. The commercial bid must contain:
 - a. Itemized cost of the system and *required* accessories, such as software, power supply, etc.
 - b. All accessories needed for the instrument to function as per the technical specification must be listed.
 - c. itemized cost, as an option, for any *suggested* accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
 - d. The cost of shipping plus insurance up to IISc has to be included. IISc will help the shipping company to take care of the customs clearance at Bangalore Airport.
 - e. Please indicate the warranty provided with the tool. Warranty of 3 years or more is preferred.
 - f. Provide itemized cost for *required/expected* spares for 3 years of operation. For sake of this calculation, the vendor may assume active tool usage of 40 hours/week. This number will be used to estimate the life cycle cost of the tool.
 - g. The cost of annual maintenance contract (AMC). The details of AMC are given below. This number will be used to estimate the life cycle cost of the tool.
 - h. Length of time that the tools will be supported with service and spares from the date of installation. Our requirement is that the tools be supported for at least 5 years from the date of installation. To quote lowest price, vendors often quote for obsolete or soon-to-be obsolete equipment. This is NOT acceptable. For a user-facility like CeNSE, it is vital that the equipment be serviceable and supported for the foreseeable future. The length of guaranteed support will be used to estimate the life cycles cost of the tool.
 - i. The commercial bid should indicate the following separately: (a) equipment price (b) optional items (c) Freight and insurance cost (d) Shipping cost and (e) the Total cost.
8. As an additional option, provide cost of an annual maintenance contract (AMC) for 3

- years, post warranty. The AMC must
- a. cover 1 scheduled and 1 emergency visit per year.
 - b. The emergency visit should be supported with a 48-hour response window.
 - c. clarify if maintenance will be done by a trained onsite engineer (CeNSE employee) or a specialist from the OEM.
 - d. in case the OEM is foreign, clarify if maintenance will be done by a trained engineer from India (local representative or Indian subsidiary) or by a trained engineer from abroad.
 - e. include an itemized list of spares (e.g., maintenance kits) that are essential for scheduled visits.
9. The commercial bids will be evaluated based on life-cycle cost of the tool. This includes the cost of purchase, maintenance, spares, etc. The final decision will be made by the committee.
10. The RFQ must include references of 5 previous installations with similar requirements, preferably in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently. Details of such systems with model numbers and users should be provided.

All the proposals should be addressed to:

Attn: Prof. Ambarish Ghosh
Centre for Nano Science and Engineering
Indian Institute of Science
Bangalore – 560012, India

The Proposals should arrive at the Main office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, on or before the deadline of April 18, 2022, 2:00 pm Indian Standard Time.

Questions regarding this tender should be addressed to Dr. Ambarish Ghosh at the email address ambarish@iisc.ac.in with the subject line “Query _Tool name_Bidder’s name”.

Post such submission all vendors should send an email to ambarish@iisc.ac.in with the subject line: “Submitted bid Bidder’s name_Tool Name” to intimate him of the submission within one day.

II. General terms and conditions:

1. The institute reserves the right to accept or reject any bid, or to annul the bidding process and reject all bids, at any time prior to the award of contract without thereby incurring any liability of the affected bidder or bidders.
2. Previous installations can be used by the committee to disqualify vendors with poor track record of service, build quality, system performance or poor availability of spares.

3. 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 should be provided.
4. The vendor should be able to repair and maintain the equipment once it is installed. Clarify if periodic (preventive) maintenance can be done by a trained on-site engineer (i.e. IISc employee) or requires a specialist from the OEM. The bidder should have qualified technical service personnel for the equipment based in India and must assure a response time if <24 hours after receiving a service request.
5. All the quotations must be valid for at least 120 days at the time of submission.
6. The quotations should clearly indicate the terms of delivery, delivery schedule, tax, and payment terms.
7. In case of the award of purchase order, the vendor must provide an Order Acknowledgement within 30 days from the receipt of the Purchase Order.
8. The lead-time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.
9. The bidder is responsible for the installation of the equipment in the IISc campus.
10. Necessary training to operate the procured setup and required literature support (in English language) should be provided without additional cost.
11. Bidders should undertake to support the system with spares and software bugfixes, if any, at least for the next 5 years.
12. Data must be supplied along with the technical compliance documents. Technical bids without supporting data can be deemed as technically non-compliant.
13. Printed literature and published papers in support of all compliance to the prescribed specifications are encouraged.
14. All guaranteed specifications will have to be demonstrated, upon request, in an active installation. Failure to demonstrate any promised specifications will be deemed as technical non-compliance.
15. Technical evaluation by the institute must include demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the promised specifications and demonstrated specifications will be deemed as technical non-compliance. If need arises, the vendor must be ready to physically visit IISc for a techno commercial discussion.
16. The intender reserves the right to withhold the placement of the final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all the above conditions without assigning any reason.

III. Technical specifications of the Microscopy system combining biological imaging and quantum sensing:

A. Technical Specifications of Motorized Inverted Fluorescence Research Microscope with Confocal:

Please note all optional Items must be quoted separately in the commercial part.

S.No	Specification	Essential/Optional
1.	Fully Motorized double deck Inverted Fluorescence Microscope for BF/DIC/Fluorescence with remote control for controlling motorized components of the microscope and safety features like interlock for lasers	Essential
2.	Trinocular observation tube with three position prism for selection of light path for full observation to 10X eyepiece, 50% - 50% Camera Port - eyepiece, 100% Camera Port	Essential
3.	Programmable (Linear Encoded) motorized X-Y scanning stage including multipoint, tile and mosaic imaging software	Essential
4.	LED illumination for Bright field (halogen color). Minimum power for BF LED illumination with minimum flux of 25lm@500mA and a life time of 10,000 Hrs	Essential
5.	Fibre coupled LED illumination for Fluorescence catering to the following fluorophores to be included. Minimum power for Fluorescence LED illumination >1000mW after the fiber /liquid light guide, with a lifetime of 25,000 hours.	Essential
6.	Band pass fluorescent filters for DAPI, CFP, GFP, Cy3, Cy5; atleast 4 empty filter cube: these are part of the turret	Essential
7.	Should have the provision of coupling our own laser/LED light sources for widefield fluorescence microscopy. This light path should be IR-compatible up to 1300 nm excitation, provision of including customized fluorescence cubes, including those for upconversion.	Essential
8.	Motorized 6 position revolving DIC nosepiece, Long working distance Condenser (NA 0.55/WD.27mm or better) with modules for DIC and minimum 5 position turret .	Essential
9.	High precision Z-focus drive with step size of 10 nm or better.	Essential
10.	Z Drift Compensator for long time stability time lapse imaging (must use near IR light to detect the correct focus position.)	Essential
11.	C Mount Adapter for Left Side 100% Port for mounting Camera.	Essential
12.	C Mount Adapter for Trinocular Port for mounting Camera.	Essential
13.	Side (preferably right) Port with appropriate beam splitter for separate laser path for user supplied 5W 1064 nm laser for optical tweezer applications	Essential
14.	Motorized 8 position fluorescent mirror turret, with motorized shutter	Essential
Optional Items (to be quoted separately in the commercial part)		
15.	CCD or sCMOS camera for wide field imaging in epifluorescence and DIC imaging modes. Minimum resolution of 2048 x 2048 pixels. QE	Optional

	between 500 to 850 nm should be greater than 45%, with peak QE at least 82%. minimum full resolution frame rate 40 fps.	
16.	High speed connection (camera link, CoaXPress etc.) for full resolution frame rates of 100 fps for the CCD or sCMOS camera	Optional
17.	Plan super apochromat objectives - 40x/0.95 air	Optional
18.	Plan super apochromat objectives - 60x/1.42 oil immersion	Optional
19.	Plan super apochromat objectives - 100X/1.45 oil.	Optional

B. Confocal imaging unit & lasers with high sensitivity detectors

S.No	Specification	Essential/Optional
1.	<p>Two channel Spectral detector with 2 multi-Alkali PMT capable of working in intensity and spectral imaging mode with spectral efficiency of 2nm resolution accuracy or better.</p> <p>The system should be able to perform both online and offline spectral unmixing. The spectral detectors should be directly connected to the scan head without any fiber interface to avoid any signal loss due to fiber.</p> <p>Transmitted Light detector integrated with transmitted light photomultiplier detector & LED lamp, with motorized switching.</p> <p>PMT sensitivity at 550 nm should be minimum 25-30%. The system should be onsite upgradable to additional 2 High Sensitive spectra GaAsP detectors if required in future. The scan head should have a bypass option to take the entire signal to external GaAs Detector through continuously variable pinhole or selective visible and NIR wavelength between internal spectral detectors for visible light imaging and NIR imaging/g2 measurements or up conversion data collection through external detectors.</p>	Essential
2.	<p>Hybrid scanner, with XY, as well as Y + resonant X modes with speed scanning of</p> <p>15 fps or better at 1024 x 1024 pixels</p> <p>or</p> <p>30 fps or better at 512 x 512 pixels</p> <p>and 438fps or better when clipped to 512x32 at 1X Zoom without compromising the FOV</p>	Essential
3.	<p>Laser Combiner with 4 SOLID STATE Lasers, of wavelengths in these ranges: 400-410, 480-490, 530-578 & 620-660 nm, with minimum powers 50 mW, 18mW, 18 mW and 35 mW with fast laser switching capability (using either AOTF or some similar technology: please specify).. Bleed through Less than -40dB (In laser power: 0.01%) Leakage Less than -65dB (In laser power: 0.00003%)</p> <p>Power stability $\pm 20\%$ in $\pm 2.4^\circ\text{C}$. The imaging software should give access to control the intensity and banking of our laser through a dedicated analog box & externa trigger for seamless imaging with built in laser as well as out custom laser (SC NIR/vis/IR lasers. All the built-in lasers should be usable in future for FCS and FCCS upgradation.</p>	Essential

4.	Capability to replace the vendor supplied laser with a user supplied laser. Please mention separately if the laser, and the dichroics in the combiner can be replaced on site.	Essential
Optional Items (to be quoted separately in the commercial part)		
5.	Cost of the replacement process with necessary components to be quoted as optional items.	Optional

C. System control and Imaging software

S.No	Specification	Essential/Optional
1.	Software should be capable (e.g. SDK) of controlling every component of the system including microscope, laser and confocal unit. Should be compatible for 3D, 4D, 5D and 6D imaging (X,Y,Z,t,multi color, multi point). Image stitching in coordination with XYZ stage. The SDK should give an access to the scanning parameters and the data out put through Analog box to be controlled through third party software such as matlab/labview for customised applications.	Essential
2.	Advanced 3D image reconstruction with rendering from a Z-stack image series including 3D Blind deconvolution capability in widefield and confocal modalities.	Essential
Optional Items (to be quoted separately in the commercial part)		
3.	Triggering and external instrument control capability for complex integration of the system	Optional
4	Advanced Image capture and processing software for real time 2D deconvolution, co-localization analysis,3D restoration, batch processing ,Dynamic ROI for on-line analysis, movie acquisition, Manual Multiple Image Alignment, Live deblurring ,contrast base auto focus and better high End Camera control.	Optional
5.	Software capability to perform FRAP; provide details	Optional
6.	Capability to perform FRET; provide details	Optional
7.	Capability to perform FCS; provide details	Optional
8.	High end 64 bit control computer with minimum Intel Xeon W Processor, DDR4 SDRAM 48 GB or more; primary HDD – 512 GB SSD or better; secondary HDD: 4 TB SATA (2TB x2), DVD, SuperMulti SATA +R/RW, Graphics card: dedicated dual display with minimum 2 GB DDR5 internal RAM, Gigabit Ethernet, Win 10 Pro or better, USB 3.0, Fire wire. Large 32” LCD/ TFT monitor or better. The machine should have atleast two empty PCI slots.	Optional

D. Customized three ports for laser introduction & incorporate desired External detectors.

1	<p>Customized Laser combiners with three laser input ports & DM and Polarised beam splitters for combining the following lasers, in addition to the 4 built in lasers, which will be used for confocal imaging:</p> <ul style="list-style-type: none"> a) Separate IR port for user supplied Supercontinuum (IR part of the spectrum) and user supplied IR lasers in ~ 640 -1300nm wavelength range b) Provision for coupling visible light: 532 nm CW/pulsed laser from the user along with user supplied Supercontinuum visible spectrum (~ 400-750nm) laser 	Essential
2	8 position excitation dichroic mirror turret (for the confocal scanner) with built in quad band notch filter (>90 Reflection/Transmission) appropriate for the incidence of specified user supplied and built in lasers. Please quote separately for the following configurations, as available.	Essential
3.	Quad band notch filter for 405/488/560/640 to be placed in the excitation mirror turret which directs the specified wavelengths through the confocal scanner.	Optional
4.	Quad band notch filter for 488/532/975 to be placed in the excitation mirror turret which directs the specified wavelengths through the confocal scanner.	Essential
5.	Quad band notch filter for 488/532/730/975 to be placed in the excitation mirror turret which directs the specified wavelengths through the confocal scanner.	Optional
6.	Quad band notch filter 445/514 to be placed in the excitation mirror turret which directs the specified wavelengths through the confocal scanner.	Optional
7.	High end (preferably from Chroma) filter set (for widefield fluorescence microscopy) for 532nm excitation / 600-700nm emission (For NDs: nanodiamonds) [can be included with A-6]	Essential
8.	High end (preferably from Chroma) filter set (for widefield fluorescence microscopy) for 730nm excitation / 758nm emission(For DY-730 dye) [can be included with A-6]	Optional
9.	High end (preferably from Chroma) filter set (for widefield fluorescence microscopy) for 975nm excitation / 804nm emission(For UPCNPs) [can be included with A-6]	Optional
10.	Provision to direct the fluorescence outside for further processing.	Essential
11	<p>Appropriate filters to separate emission to internal and external detectors, with the following emission wavelength specifications:</p> <ul style="list-style-type: none"> a) Long Pass 600nm filter b) Long pass 750nm filter c) Short pass 750nm filter 	Optional
12	<p>Provide appropriate rig, so that the fluorescence coupled outside can be further divided into two parts:</p> <ul style="list-style-type: none"> a) One part will divert the IR/ NIR part (>800nm) and then coupled to a GaAs PMT. b) The other part with appropriate choice of emission filters allows selection of visible (400 – 750 nm) or IR (750 – 1300 nm), and subsequently coupled to a fiber. The fiber output from the rig mentioned above should be compatible with Picoquant g2 	Optional

	detection systems.	
13	A GaAs PMT with quantum efficiency of at least 20% in 500-800nm and around 10% or better in 800-850nm range	Optional
14	Complete schematic diagram of the entry and exit of the light paths need to be shared, including the port of entry for the tweezer (1064 nm) laser	Essential

E. Imaging

1	Dual Cam: Provision for two cameras on one microscope port with complete 50/50 beamsplitter cube and auxiliary interchangeable emission filter holders	Optional
2	Two way emission image splitter with dedicated bypass mirror for single channel operation, rectangular input diaphragm, calibration cube and emission / excitation filter cubes for 25mm filters (Empty)	Optional
3.	Polarisation Accessories which can be integrated with the 2-way emission image splitter for polarisation specific observations.	Optional

Thanking you,

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