

	<p style="text-align: center;"><b>INDIAN INSTITUTE OF TECHNOLOGY MADRAS</b> Chennai 600 036</p> <p>Telephone: [044] 2257 9798/9723      FAX: [044] 2257 4855 E-mail: <a href="mailto:arpp@iitm.ac.in">arpp@iitm.ac.in</a></p>	
---	---	---

V. Sathyanarayanan  
Senior Manager (Project Purchase)

Ref: PHY/JKRA/007/2018  
Date: 05.11.2018

**Open Tender No: PHY/JKRA/007/2018**

**Due Date: 26<sup>th</sup> November 2018, 2pm**

**Pre-Bid meeting: - Not required.**

**Technical Bid opening meeting on 26<sup>th</sup> November 2018, 3:00 PM at Department of Physics, IIT-Madras.**

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of **"Solar Simulator"** conforming to the specifications given in Annexure I.

Vendor who can supply and integrate the above equipment alone need to respond to the tender please.

**Instructions to the Bidder**

- I. Preparation of Bids:** - The tenders should be submitted under two-bid system (i.e.) Technical bid and Financial bid.
- II. Delivery of the tender:** - The tender shall be sent to the addresses mentioned below, either by post or by courier so as to reach our office before the due date and time specified in our schedule. The offer/bid can also be dropped in the tender box on or before the due date and time specified in the schedule.  
The tender box is kept in the office of the:  
  

**Senior Manager,  
Project Purchase,  
IC & SR Building 2<sup>nd</sup> floor,  
I.I.T. Madras,  
Chennai – 600 036.**
- III. Opening of the tender:** - The offer/bids will be opened by a committee duly constituted for this purpose. The technical bids will be opened first and will be examined by a technical committee which will decide the suitability of the bids as per our specifications and requirements. All bidders will be invited for opening of the technical bids. With respect to opening the financial bid, only technically qualified bidders will be called.
- IV. Prices:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to the **Department of Physics**. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. Kindly note that IIT Madras is eligible for concessional GST and relevant certificate will be issued.

In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and the price should be quoted on EX-WORKS and CIP basis indicating the mode of shipment.

- V. **Agency Commission:** - Agency commission, if any, will be paid to the Indian agents in rupees after receipt of the equipment and its satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in the tender document even in the case of 'Nil' commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent. The foreign Principal should indicate the percentage of payment and it should be included in the basic price quoted originally (if any)..
- VI. **Terms of Delivery:** - The item should be supplied to the **Department of Physics, IIT Madras** as per the Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.
- VII. **Technical Bid Opening:** The technical bid will be on 26<sup>th</sup> November 2018, 3:00 PM at the **Department of Physics, IIT-Madras**. The financial bids of those tenders who are technically qualified will be opened at a later date under intimation to them.
- VIII. **IIT Madras** reserves the full right to accept / reject any tender at any stage without assigning any reason.

Yours sincerely,

**V. Sathyanarayanan**  
**Senior Manager (Project Purchase)**  
**IC&SR Building, I.I.T. Madras,**  
**Chennai – 600 036.**

## SCHEDULE

### Important Conditions of the tender

1. The due date for the submission of the tender is **26.11.2018, 2 pm.**

The offers / bids should be submitted in two bids systems (i.e.) Technical bid and financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes, transportation, packing & forwarding, installation, guarantee, payment terms, pricing terms etc. The Technical bid and financial bid should be put in separate covers and sealed. Both the sealed covers should be put in a bigger cover. The Open Tender for supply of **"Solar Simulator"** should be written on the left side of the Outer bigger cover and sealed.

2. **EMD: - The EMD in the form of account payee DD for 2% value of the item in favor of Registrar IIT Madras should be enclosed in the cover containing financial bid.** Any offer not accompanied with the EMD shall be rejected summarily as non-responsive.

The EMD of the unsuccessful bidders shall be returned within 30 days of the end of the bid validity period. The same shall be forfeited, if the tenderers withdraw their offer after the opening during the bid validity period. The Institute shall not be liable for payment of any interest on EMD. EMD is exempted for Micro and Small Enterprises (MSE) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME).

***When no local agent, the foreign vendor can submit demand draft equal to 2% or wire transfer the amount to our account as detailed in the attachment (Annexure II) and enclose the proof with the financial bid.***

3. **Performance Security: -** The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD, FD Receipt from the commercial bank, Bank Guarantee from any nationalized bank in India. **The performance security should be furnished within 21 days from the delivery of the purchase order.**

**Performance Security in the form of Bank Guarantee:-** Incase the successful bidder wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed through the Beneficiary Bank to the end user bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee from a Nationalized Bank of India.

The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

4. **Indian agent:** If an Indian agent is involved, the following documents must be enclosed:  
Foreign principal's proforma invoice indicating the commission payable to the Indian Agent and nature of after-sales service to be rendered by the Indian Agent.
  - ✓ Copy of the agency agreement with the foreign principal and the precise relationship between them and their mutual interest in the business.
5. The offer/bids should be sent only for a machine that is available in the market and supplied to a number of customers. A list of customers in India and abroad with details must accompany the quotations. Quotations for a prototype machine will not be accepted.
6. Original catalogue (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid. No prices should ever be included in the Technical bid.

7. Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal.
8. **Validity:** Validity of Quotation not less than 90 days from the due date of tender.
9. **Delivery Schedule:** - The tenderer should indicate clearly the time required for delivery of the item (subjected to the executive committee-IITMadras approval). In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.  
If there is delay, the penalty will be @1% per week of delay subject to a max of 10% of the value of purchase order and if the delay is more than accepted time frame by IITM, the PO would be cancelled and liquidated damages will be enforced.
10. **Risk Purchase Clause:-** In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
11. **Payment:-**
  - (i) No Advance payment will be made for Indigenous purchase. However 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).
  - (ii) **Advance Payment:** No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Foreign Vendor has to submit a Bank Guarantee equal to the amount of advance payment and it should be routed through the Beneficiary Bank to the end user Bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee through a Nationalized Bank of India.
12. **On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within 15 to 20 days from the date of receipt of the item at site of IIT Madras.
13. **Warranty/Guarantee:** - As per the tender specification.
14. **Late offer:** - The offers received after the due date and time will not be considered. The Institute shall not be responsible for the late receipt of Tender on account of Postal, Courier or any other delay.
15. **Acceptance and Rejection:** - I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.
16. **Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.**

**17. Disputes and Jurisdiction:**

**Settlement of Disputes:** Any dispute, controversy or claim arising out of or in connection with this PO including any question regarding its existence, validity, breach or termination, shall in the first instance be attempted to be resolved amicably by both the Parties. If attempts for such amicable resolution fails or no decision is reached within 30 days whichever is earlier, then such disputes shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996. Unless the Parties agree on a sole arbitrator, within 30 days from the receipt of a written request by one Party from the other Party to so agree, the arbitral panel shall comprise of three arbitrators. In that event, the supplier will nominate one arbitrator and the Project Coordinator of IITM shall nominate an arbitrator. The Dean IC&SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceeding shall be carried out in English language. The cost of arbitration

and fees of the arbitrator(s) shall be shared equally by the Parties. The seat of arbitration shall be at IC&SR IIT Madras, Chennai.

- a. **The Applicable Law:** This Purchase Order shall be construed, Interpreted and governed by the Laws of India, Court at Chennai shall have exclusive jurisdiction subject to the arbitration clause.
- b. Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.

20. All Amendments, time extension, clarifications etc., will be uploaded on the website only and will not be published in newspapers. Bidders should regularly visit the above website to keep themselves updated. No extension in the bid due date/ time shall be considered on account of delay in receipt of any document by mail.

**Acknowledgement:** - It is hereby acknowledged that the tenderer has gone through all the conditions mentioned above and agrees to abide by them.

**SIGNATURE OF TENDERER  
ALONG WITH SEAL OF THE  
COMPANY WITH DATE**

## Tender Notice for Solar Simulator

### Proposed Use of the Machine:

The system is to be purchased to provide illumination approximating natural sunlight. And it should provide a controllable indoor test facility under laboratory conditions, used for the testing of solar cells, sun screen, plastics, and other materials and devices.

### Input Workpiece Dimensions:

- 1) Material : Mono-crystalline Silicon, thin film (a-Si, , Perovskite, tandem solar cell)
- 2) Maximum Size (Ø) :  $\leq 4''$  inch square
- 3) Thickness :  $< 300$  microns

### General requirements

- Dual lamp solar simulator
- solar simulator has a production history  $> 30$  years
- Simulator life time  $> 10$  Years
- Installed base in any continent of more than 80 solar simulator units
- At least 7 major world class photovoltaic institutes/labs using two lamp solar simulator system
- Real Class AAA solar simulator
- Non uniformity of irradiance within  $\pm 2\%$
- AM1.5G spectrum within  $\pm 10\%$
- Temporal instability within  $\pm 1\%$  / hour

### Technical Specifications:

#### (A) STANDARD MACHINE:

S.NO	ITEMS	SPECIFICATION
1	Lamp Type 1)Xenon lamp 2)Halogen Lamp	a) Dual lamp light with smooth spectrum. b) No large spikes (of Xe line) in the range from ( $\lambda$ ) 850 to 1100 nm.
2	Effective Irradiated area	100mm X 100mm
3	Direction of Irradiance	Down Shine
4	Irradiance	100 mW/cm <sup>2</sup> (at 1 SUN)
5	Spectral Match	Approximating AM 1.5G (at 1 SUN)
6	Collimating angle	Within $\pm 3^\circ$

7	Positional Non-uniformity of irradiance	Within +/-2% (at 1 SUN)
8	Temporal Instability of Irradiance	Within +/-1% (at 1 SUN)

#### (B) Power Requirements

1	Xenon Lamp Power Supply	AC230V
2	Halogen Lamp Power Supply	AC230V

#### (C) Operating Conditions

1	Ambient Operating Temperature	15 to 30°C
2	Relative Humidity	Maximum 80%
3	Transportation/Storage Temp.	-25 to 55°C

#### (D) Construction

##### (1) Lamp House

1	Air Cooling System	Lamp cooling fan , Propeller exhaust fan
2	Lamp (Dual)	Xenon short arc lamp Halogen lamp
3	Interlock	Equipped at two housing doors
4	1)Light Adjustment  2) Spectrum Adjustment	Irradiation and spectrum of the two light sources should be respectively adjusted. The procedure for this adjustment will be provided by the vendor. At the factory Shipment, the option ratio of the two light sources which creates the best spectrum is measured and presented as <b>halogen ratio</b> in %.
5	Weight	≤ 200kg
6	Lamp Power Supply	a) Machine should be operable using the Indian standard AC power supply: equipment needed for any voltage conversion has to be supplied. b) Adequate protection against power line must be provided. c) Machine should be operable using standard shop air environment.
8	Warranty and Maintenance	a) Minimum 1 year on-site warranty for all the components from the date of installation against all the design, material or manufacturing defects. b) The vendor shall install and configure all required hardware and open source software suites. Provide necessary cables/wires and any other accessories for connecting the supplied components. The bidder must install the complete system and interconnections required. c) Operational and maintenance ease be taken into account.
9	Safety	a) Accessibility to the workable in the machine.

		b) The machine should be equipped with all the safety features necessary to protect the machine, control and the operator while in operation from possible damage/injury.
10	Supplier capability	a) Bidder should provide the list of installations and commissioning of a similar machine in a related industry/ institution anywhere in the world where it is being used successfully with customer feedback.

(E) Additional Features

1	Shutter Function	Open/close by a manual switch or by external signal
2	Interlock Function	The lamp is turned off if the lamp replacement door is opened
3	Irradiance Stabilization	Stabilize irradiance by internal monitor and feedback-circuit
5	Lamp Axis Adjustment	Preferably by three-axis (XYZ) adjuster

(F) Documents and Accessories

1	Documents CD-ROM 1) Manual File  2) Calibration Certificate	Inspection Sheet ----- 1 sets Operation Manual ----- 1 sets Specification ----- 1 sets ----- 1 copy
2	Accessories 1) Protect Glasses 2) Gloves	----- One pair ----- One pair

(G) Inspection Items (Acceptance test)

S.No	Specification	At Factory Shipment	At Customer Installation
1	Lamp Type Xenon lamp Halogen lamp	See if the correct lamps are installed	See if the correct lamps are installed
2	Effective Irradiated Area 100mm X 100mm	Measure the size with a ruler	Measure the size with a ruler
3	Direction of Irradiance Down Shine	See if the direction is correct	See if the direction is correct
4	Irradiance 100mW/cm <sup>2</sup> (at 1SUN)	Measure at the center with a thermopile	Measure at the center with a thermopile
5	Positional Non-uniformity of irradiance	Measure at 17 points with a thermopile	Measure at 17 points with a thermopile
6	Temporal Instability of Irradiance	Measure at the center with a PV cell	Do not measure
7	Spectral Match	Measure with a Spectroradiometer	Do not measure
8	Collimating angle	Measure using a pinhole	Do not measure

(H) List of Consumables and their expected delivery time

Short term consumable parts (parts to be covered by warranty) and Long term consumable parts should be available and delivered within 3 months and 6 months respectively.





CENTRE FOR INDUSTRIAL CONSULTANCY & SPONSORED RESEARCH (IC&SR)  
INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
CHENNAI 600 036



**B NAGARAJAN**  
JOINT REGISTRAR (IC & SR)

Project Accounts  
July 22, 2016

**TO WHOMSOEVER IT MAY CONCERN**

In connection with project, **US currency may be transferred to CANARA BANK, IIT - MADRAS Branch** with the following details.

**FOR TRANSFER OF CURRENCY US DOLLAR**

**Please Credit in USD**

**(THROUGH )**

JP MORGAN CHASE, NEW YORK  
SWIFT CODE: CHASUS33

**For Credit to**

USD ACCOUNT No: 001-1395969, of CANARA BANK INTERNATIONAL DIVISION  
MUMBAI

**For Further Credit to**

ACCOUNT NO: **2722101001741** of IIT Chennai – Swift Code: **CNRBINBBIIT**  
**OF THE REGISTRAR, IIT, MADRAS**

**JOINT REGISTRAR (IC & SR) i/c**

**संयुक्त कुलसचिव (आई.सी. एवं एस.आर.)**  
**JOINT REGISTRAR (IC & SR)**

**आई.आई.टी. मद्रास**

**This is to certify that the particulars furnished are correct.** **IIT, MADRAS**

**For Canara Bank**

**Senior Manager**  
**Canara Bank - IIT Madras branch**



**एस.अरवींदन**  
**S.ARAVINDAN**  
सिनिअर प्रबंधक Senior Manager  
प.अ.सं. S.P.No.31649