



**PONDICHERRY UNIVERSITY, PUDUCHERRY – 605 014**

*(A central University)*

**DEPARTMENT OF ASTROPHYSICS**

Sealed tenders are invited under single bid system for purchase of Minor Equipments. The tenders duly signed and sealed should be submitted in the name of The Registrar, Pondicherry University to the address below. The tenders should be sent by Post (Speed / Registered / Courier) only. The price quoted should include all the costs such as delivery, installation, testing etc., and also inclusive of all taxes. Warranty terms should be explicitly specified in the tender. The technical specifications are given below. **Last date for receiving Tender is 27.11.2012 at 3.00 p.m.**

<b>Sl.No</b>	<b>Name of the Instruments</b>
1	<p><b>Constant Deviation Spectrometer</b> Constant Deviation Spectrometer Calibration range: 4000-7000 A° Essential Accessories: Constant deviation spectrograph prism. Accessories: Mercury vapor lamp (125 watt) with choke. Condensing lens with holder and stand Micrometer eyepiece. Total travel: 0-25 mm; L.C: 0.01 mm. Attachment to convert C.D.S. into monochromator Fabry-Perot Etalon, clear aperture: 25mm Edser-Butler plate. Clear aperture: 25 mm Arc stand with pair of brass, copper, iron rods. With CDS prism of 1.787 <b>Extra:</b> Arc power supply for Iron, copper, brass rods</p>
2	<p><b>B-H Curve</b> Setup consisting of main unit having variable A.C. supply and control for magnetizing coil, specially designed power supply for pickup probe, I.C. holder having magnetizing coil and pickup probe. Samples (4)</p>
3	<p><b>Magnetic Susceptibility by Guoy's Method:</b> Sample in the form of a long rod: set of 4 samples, each of ebonite and wood Electromagnet: Pole Pieces: 75mm tapered to 25mm Mag. Field: 10KG at 15mm gap Power supply: Current range: smoothly adjustable from 0-3A per coil, i.e.6A Display: 3½ digit, 7 segment LED DPM Gauss meter: Range: 0-2KG &amp; 0-20KG Resolution: 1G at 0-2KG range Display: 3½ digit, 7 segment LED DPM with auto polarity and over flow indication Electronics Balance: Capacity: 40mg – 720gms. With bottom loading facility.</p>

4	<p><b>Four Probe Method</b>  Micro voltmeter; range:0-200mV &amp; 0-2v, Resolution: 100<math>\mu</math>v &amp; 1mV, display:3½ digit  Constant Current Source  Current Range: 0-20mA, resolution: 10<math>\mu</math>A and display: digital 3½ digit  Oven: from room temperature to 300°C  Sample: Ge crystal Wafer: size 10x12mm and thermocouple  b) Setup with thermocouple and separate digital temperature indicator.</p>
5.	<p><b>The Hall Effect Setup</b>  Range:0-200mV (100<math>\mu</math>V minimum) Accuracy: <math>\pm</math>0.1% of reading <math>\pm</math>1 digit  Temperature: Up to 50°C</p> <p>(ii) <b>Constant Current Power supply:-</b>  Current:0-20mA  Resolution:10 <math>\mu</math>A  Accuracy: <math>\pm</math>0.2% of the reading <math>\pm</math>1 digit  Load regulation:0.03% for 0 to full load  Line regulation:0.05% for 10% variation</p>
6	<p><b>Electrons Spin Resonance Spectrometer:</b>  (It consists of D.C Power supply: DC Voltage: 20V, Load regulation: 0.3% and Ripple: &lt;3mV  Helmholtz Coils: No. turns 500 in each coil, Diameter of the windings: 15 cm and Separation of coil: 7.5 cm  Test Sample: A test sample, Diphenyl Picryl Hydrazyl(DPPH)  R.F. Oscillator: Frequency range:9.5 MHz-18.0 MHz)</p>
7	<p><b>Fourier Analysis Kit</b>  The Kit should consist of a stabilized power supply and the analyzer. Square, triangular and clipped sine waveforms are generated by a specially designed integrated circuit function generator whose output frequency should vary in the range of 500 Hz to 15 KHz. The output level of the sine and triangular waves should vary using the amplitude control provided on the front panel of the unit. The frequency of the generator should vary using the100 K<math>\Omega</math> Ten Turn Potentiometer.</p>
8	<p><b>Precision Interferometer</b>  It consists of: Interferometer main frame – 1 No.; He-Ne Laser – 1 No.; Laser Holder – 1 No.; Ground Glass Screen – 1 No; Holder for beam expander – 1 No., Extension Arm – 1 No.; Two-in-one observation screen – 1 No.; Transparent slice clamp – 2 Nos.; Sodium – Tungsten lamp – 1 No.; Air chamber and pump with gauge – 1 No.  Specifications: Flatness of beam and compensator – 0.05<math>\lambda</math>, Coarse Travel of mirror – 10mm; Fine Travel of mirror – 0.625mm; Fine Travel Resolution – 0.25<math>\mu</math>m, Fabry-Perot mirrors 30mm (dia), R=95%; He-Ne Laser output – 0.07 – 1 mW@632.8nm; Wavelength measurement accuracy – Relative error: 2% for 100 fringes, Sodium- Tungste4 lamp sodium lamp: 10W; Tungsten lamp: 15W, Air Chamber and Air pump with gauge – chamber length: 80mm; Pressure range: 0-40 KPa.</p>

9	<p><b>Lens Aberration and Fourier Optics Kit</b>  It consist of Optical Rail – 1; Laser Holder and Carrier – 1 No.; Carrier – 2 Nos, Lens f = 4.5, 50, 100, 150mm – each -1 No.; Plano-convex lens f = 75mm – 1 No.; He-Ne Laser, 1.5 mW@632.8 nm/LLL -2 – 1No. Tungsten-Bromine Lamp – 1 No. Transmission Letter – 1 No., Iris – 1 No, Adjustable slit 0-2 mm width adjustable – 1 No., Spatial Filter – 1 No., White screen – 1 No., Filter Red, Green and Blue – 1 each; Plate Holder – 1 No., Lens Hold – 6 Nos, Object screen – 1 No</p>
10	<p><b>Microwave bench</b>  Technical Specifications  <b>Frequency of Operation</b> : 10 GHz (approx)  <b>Power of Transmission</b> : 10 -15 mW  <b>Operating Voltage</b> : 8 V (approx)  <b>Antennas for Transmission &amp; Reception</b> : Horn type  <b>Goniometer Scale</b> : 0° - 360°  <b>Tone Generator</b> : 1 KHz Frequency  <b>Transmitter and Receiver arm length</b> : 49 cm each (approx)  <b>Power Display</b> : Digital, Relative Measurements  <b>Power Supply</b> : 230 V ±10%, 50 Hz  <b>Accessories</b>  Microwave Transmitter  Transmitter Arm  Receiver Arm  Ganiometer Base Unit  Detector Probe  Prism  Metal Plates of different dimensions  Partial Reflectors  Din Connectors Cables  Metal Plate holder  Polarization Grille  Prism Stand  Mini Microphone</p>
11	<p><b>Zeeman Effect apparatus</b>  <b>(Direct Reading Zeeman Effect)</b>  Consists of :  F-P clear aperture: 40mm  Quartz Spacer thickness: 2.2±0.10mm  Magnetic Induction: 0~13000 Gauss  Central Wave-length: <math>\lambda=546.1\text{nm}</math></p>

12	<p><b>Frank Hertz experiment</b> It consists of following:</p> <ul style="list-style-type: none"> <li>• Argon filled tetrode</li> <li>• Filament power supply: 3.6 – 4.3 continuously variable</li> <li>• Power Supply for <math>V_{G1K}</math>: 1.3-5V continuously variable</li> <li>• Power Supply for <math>V_{G2A}</math>: 1.3-5V continuously variable</li> <li>• Power Supply for <math>V_{G2K}</math>: 1.3-5V continuously variable</li> <li>• Saw tooth wave form for CRO display</li> <li>• Scanning voltage: 0-80V</li> <li>• Scanning frequency: <math>115 \pm 20</math>Hz</li> <li>• Multirange Digital Ammeter</li> <li>• Display; 3½ digit, LED</li> </ul> <p>This instrument not only lead to a plot of the amplitude spectrum curve by means of point by point measurement, but also directly display the amplitude spectrum curve on the oscilloscope screen.</p>
13	<p><b>Hydrogen spectra study using grating spectrometer:</b> spectrometer with 9/10 inch with fine resolution, made in UK grating with 600lines/mm along with Hydrogen lamp and power supply.</p>
14	<p><b>Black body radiation and Wien's law using Prism spectrometer:</b> complete setup with 9/10 inch dia prism spectrometer with radiation source etc.</p>
15	<p><b>Intensity profile of laser through optical fiber and determination of refractive index profile</b> complete setup with small bread board 9x24inch x60mm with honey comb structure with optical fibers Helium neon laser with power supply mount and base, Goniometer stage-Y stage detector with meter along with microscopic objectives and its holder, bases, fiber holder and cables with spare fibers 100m each.</p>
16	<p><b>Study Of laser beam characteristics beam divergence, spot size and intensity profile</b> : setup is supplied with Helium neon laser with power supply and stand, long X stage with LC 0.01mm, knife edge micrometer controlled with LC 0.01mm with lens and lens holder ,Detector and meter. All are with honey comb bread board 1x4feet x 60mm along with Computerization of above system with Fringe capture and analysis system along with CCD detector, software and power supply. ( without PC and printer)</p>
17	<p><b>To verify Malus law of polarization:</b> Complete setup on research optical bench size 170cms long lathe bed type bench with Vee and flat ways precise ground for straightness, four leveling screws with footplates, scale for determining the position of the carriages graduated every 1 mm should be précised, scale made of brass, Saddles transverse base with Vernier motion LC 0.1mm, Laser Mount 1 no, Polarizer and analyzer , He-Ne laser-2mW with power supply along with laser mount, detector having linear response along with detector output measuring device.</p>
18	<p><b>To determine Light intensity vs. distance of a point light source:</b> Complete setup on 1 inch rod SS bench with riders along with point light source, detector and meter.</p>

19	<b>Single slit and double slit diffraction exp:</b> Complete Setup on 1 inch dia SS rod bench with single and double slits micrometer controlled L.C = 0.01mm with Fringe capture and analysis system with CCD detector , software and power supply ( without PC and printer), detector and meter with cables.
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**Dr. K. PORSEZIAN**

Co-ordinator,

Department of Astrophysics,

Pondicherry University.

## TERMS AND CONDITIONS

### I. General Information:

- a) **Last date and time of receipt of the Tender: 27.11.2012; 03.00 p.m.**
- b) **Tender Document fee Rs. 100/-**
- c) **EMD rates: Rs.5000/-**
- d) Quoting merely the lowest price does not confer any right to any bidder for award of supply order. The University's Purchase Committee, reserves the right to select the equipment any bid under the grounds of specification compliance, technologically advanced quality, proven performance track record, brand reputation, service backup support & training, offer of additional / special features, Compatibility with the existing System, etc.
- e) DD for Tender Document Fee and EMD should be taken separate and submitted along with your Tender
- f) The Tender must be submitted along with the stipulated Tender document fee and EMD in the sealed cover, super-scribing "**Tender for Minor Equipments – Department of Astrophysics**". The name and address of the bidder should also be mentioned at the "From address" space.
- g) The Tender should be addressed and posted to the following address by speed, registered post or by courier.

**The Registrar  
Pondicherry University  
PUDUCHERRY – 605 014**

- h) Tenders will not be accepted through fax / e-mail.
- i) **Opening of tender will be held on 27.11.2012** at 03.30 p.m. at the Executive Hall, Pondicherry University

### II. Common Conditions (Import or Indigenous)

#### *1. Purchase of Tender Document:*

The Tender document can be downloaded from the University website [www.pondiuni.edu.in](http://www.pondiuni.edu.in) or procured from the Pondicherry University on payment of fee as specified above, by means of a D.D, drawn in favor of **The Finance Officer, Pondicherry University, payable at Puducherry**. The downloaded application should be accompanied with the Tender document fee, in the form of a Demand Draft.

#### *2. Price Schedule*

The rates should be quoted for a single unit and also for the total quantity required by the University. The price should include the Delivery, installation, training charges, etc. at the respective Department, Pondicherry University. The prices quoted shall remain firm until the Equipment is supplied to the respective Department, Pondicherry University.

#### *3. Quoting the Core price & Tax, Duties, Discount etc.*

The taxes / duties / discounts, if applicable, are to be explicitly and separately shown in the bid.

#### *4. Eligibility:*

The firm must have the requisite domain expertise with regard to supply, installation and post-sale service of the items they are quoting. The firm should have been in existence for at least six years as on the date of this Tender and must have executed at least three orders for this kind of Equipment during the last three years.

## ***5. Duty Exemption***

The University has been granted the benefit of exemption from the payment of the Central Excise Duty and Customs Duty by the Department of Scientific and Industrial Research (DSIR), India, vide their Notification No.10/97, dated 01-03-1997 and No.51/96 dated 23.07.96 respectively, in respect of

- a) Scientific and technical instruments, apparatus, equipment, Software including computers.
- b) Accessories and spare parts of goods specified in (a) above and consumables.
- c) Computer software, compact disks, CD ROM, Recording magnetic tapes, microfilms, micro-chips etc.
- d) Prototypes.

Customs duties at Indian port, if any, will be to the account of the University.

## ***6. Technical Specifications***

- i. **WARRANTY:**

The Equipment covered under the purchase order, when installed, shall be warranted for the quality, workmanship, trouble free operation and performance for a period of at least 36 months (**preferably 3 years**) from the date of putting the system into operation at the Department of Astrophysics, Pondicherry University, or at least 42 months from the date of receipt of the last lot of the consignment.
- ii. If any item covered under warranty fails, the same shall be replaced free of cost including all the applicable charges including shipping cost both ways.
- iii. Complete technical specifications of the Equipment including the Operating system to be included in the bid.
- iv. The necessary service support should be provided by Bidder during the agreement period.
- v. The training should be provided by the supplying companies.
- vi. Operating Manual should be provided in English.
- vii. A recent customer list (within last five years) with contact details including email address is to be submitted with technical bids / bids as the case may be.
- viii. If the Equipment is proprietary a product, a proprietary product certificate should be enclosed.
- ix. The Equipment must operate at 230V / 50 Hz single phase and / or equivalent three phase electrical power.
- x. **The validity of the each quotation should be at least for THREE MONTHS from closing date.**
- xi. The offers will not be considered if received after the bid closing date and time.
- xii. The offers received through telex / tele-fax / e-mail will not be accepted by the University under any circumstances.
- xiii. The University shall not be responsible for any delay / loss or non-receipt of the Tender by post / courier service.
- xiv. No unsolicited correspondence shall be entertained after the submission of the offer.
- xv. If an order is placed with the firm, the purchase shall be governed by an agreement as per the University rules in force at the time.
- xvi. Additional terms and conditions will be incorporated in the purchase order, if needed, to safe guard the interests of the University.
- xvii. Tender is not transferable.
- xviii. In case of any dispute in respect of the Tender, all legal matters shall be instituted within the jurisdiction of the place where the purchaser ordinarily resides.

## ***7. Power to reject the offer:***

- i. Pondicherry University reserves the right to accept / reject any offer in full or in part or accept any offer other than the lowest offer without assigning any reason thereof. Any offer containing incorrect and incomplete information shall be liable for rejection.

- ii. No Agency commission will be paid to any authorized agent in India.
- iii. Liquidated damages: Timely supply of the ordered items, installation, commissioning (wherever is applicable) and training etc. is the essence of the contract. In case of failure to supply within the time specified in the Purchase order, a penalty / LD of 0.5% of the total value per week or a part thereof shall be levied subject to a maximum of 7.5% in respect of items which are not supplied. The decision of Pondicherry University shall be final in this regard.
- iv. Bidder(s) must be authorized business partners of Global / National service providers of the respective Equipment.
- v. The Bidders must enclose authorization letter from the respective global / national service providers of the above said Equipment particularly mentioning an undertaking that in case of default by the Bidder, they (Global Service Provider) shall take over all the responsibilities of the Bidder.
- vi. The Bidder should not be involved in any Bankruptcy filing for protection from it.

### **III. Specific Conditions for Imported Equipments**

#### ***1. Payment of EMD:***

The Quotation must be accompanied by EMD as stated above, by means of a Demand Draft, drawn in favor of ***The Finance Officer, Pondicherry University, payable at Puducherry.*** *The Small Scale units are exempted from payment of EMD provided they enclose the proof of their exemption Certificate issued by the competent authority.*

#### ***2. Payments terms:***

Normally a payment 90% will be released after the installation & training. However, 100% payment will be released **if the supplier provides Bank Guarantee** towards performance Security for the 10 % of the total cost of the furnace to cover the warranty period. Bank charges in India shall be borne by the purchaser and outside India shall be borne by the contractor / supplier. The offer must be in English. The rates should be indicated both in figures and words against item specified in the given table. It is preferable that the price be quoted in US Dollars or in major foreign currencies.

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**DEPARTMENT OF ASTROPHYSICS  
PONDICHERRY UNIVERSITY**

**Prof. K. PORSEZIAN**  
Co-ordinator.

**R. V. Nagar,**  
Pondicherry – 605 014.

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PU/APHYS/F-Lab/Tender - XII-Plan 2012-2013/

7.11.2012

To  
The System Manager,  
Pondicherry University,  
Pondicherry-14

Sir,

Sub: Purchase of Minor Equipments under XII-Plan Grant/ inviting limited  
Tender - Request to publish in our University Web Site – Reg.

Ref: PU/P&S/APHYS/Lab Equip./2012/1140

I am herewith enclosing the Tender format and the list of Minor Equipments, Terms and conditions for the purchase of minor equipments under limited tender. I request you to make necessary arrangements to publish the same in our University Web Site.

Thanking you

Yours faithfully,

**(K. PORSEZIAN)**

Encl: As Above