

#### **4.1.1 The institution has adequate facilities for teaching - learning. viz., classrooms, laboratories, computing equipment, etc.**

All the eleven CIs/OCC of HBNI have adequate state-of-the art teaching-learning facilities. The BARC Training School, Mumbai has sprawling building with 14 classrooms and six lecture halls. All classrooms and lecture halls are equipped with LCD facilities as well as internet connection over the BARC LAN. There are two computer laboratories exclusively for students. There is a Process Control Laboratory and a Nuclear Physics Laboratory in the building. Additionally, students have access to more than 150 laboratories in BARC to carry out laboratory work at the cutting edge of science & technology.

Similarly, the BARC Training school at IGCAR operates in a dedicated complex with classrooms provided with thin Client, Projector and LAN facility.

In HRI, there are ten classrooms and discussion rooms for the lectures. Classrooms have projector based teaching facility and are equipped with ICT facilities. There are state-of-art laboratories and a high performance Cluster Computation Facility for scientific computing. The hostels too have Wi-Fi connectivity.

IMSc has adequate class rooms, office rooms and seminar halls for faculty and students. The Office rooms and Class rooms are equipped with fast internet access and have LCD Data projector, Motorized white screen, Black/Green board, LAN &Wi-Fi. A Media centre is used for e-learning through video contents. A multi-functional studio is available for video conferencing, web streaming, video recordings, meetings, etc. Remote classroom activities are executed by faculty for other elite institutes.

IOP has four Wi-Fi and internet-based classrooms for students. It has two seminar halls equipped with LCD Projectors, white boards and internet connectivity to conduct conferences, seminars and workshops for students and faculty. It also has a computer facility dedicated for scientific computation and IT services.

RRCAT has 4 classrooms for regular teaching, some of them equipped with ICT facilities. The laboratory work is carried out in the 40 departmental laboratories equipped with pertinent equipment and trained manpower. All PhD Scholars and PG students are provided with personal computers and network based centralized high performance computing facilities for research work.

In SINP, there are five classrooms equipped with LCD projector and Wi-Fi facilities. In addition, SINP has a computer lab with more than 30 desktops with internet and computing facilities for the first year PhD students undergoing course work. There are two lecture halls

for seminars and colloquiums; and one large auditorium with audio-visual system for special lectures and events, cultural and outreach programmes.

TMC has adequate facilities of classrooms, teaching aids and access to all relevant journals and books in the library. Students receive training both through didactic lectures and are encouraged to present work in seminars, CMEs and workshops. For practical training, they get adequate exposure to the day-to-day management of patients in the clinic, wards and OTs.

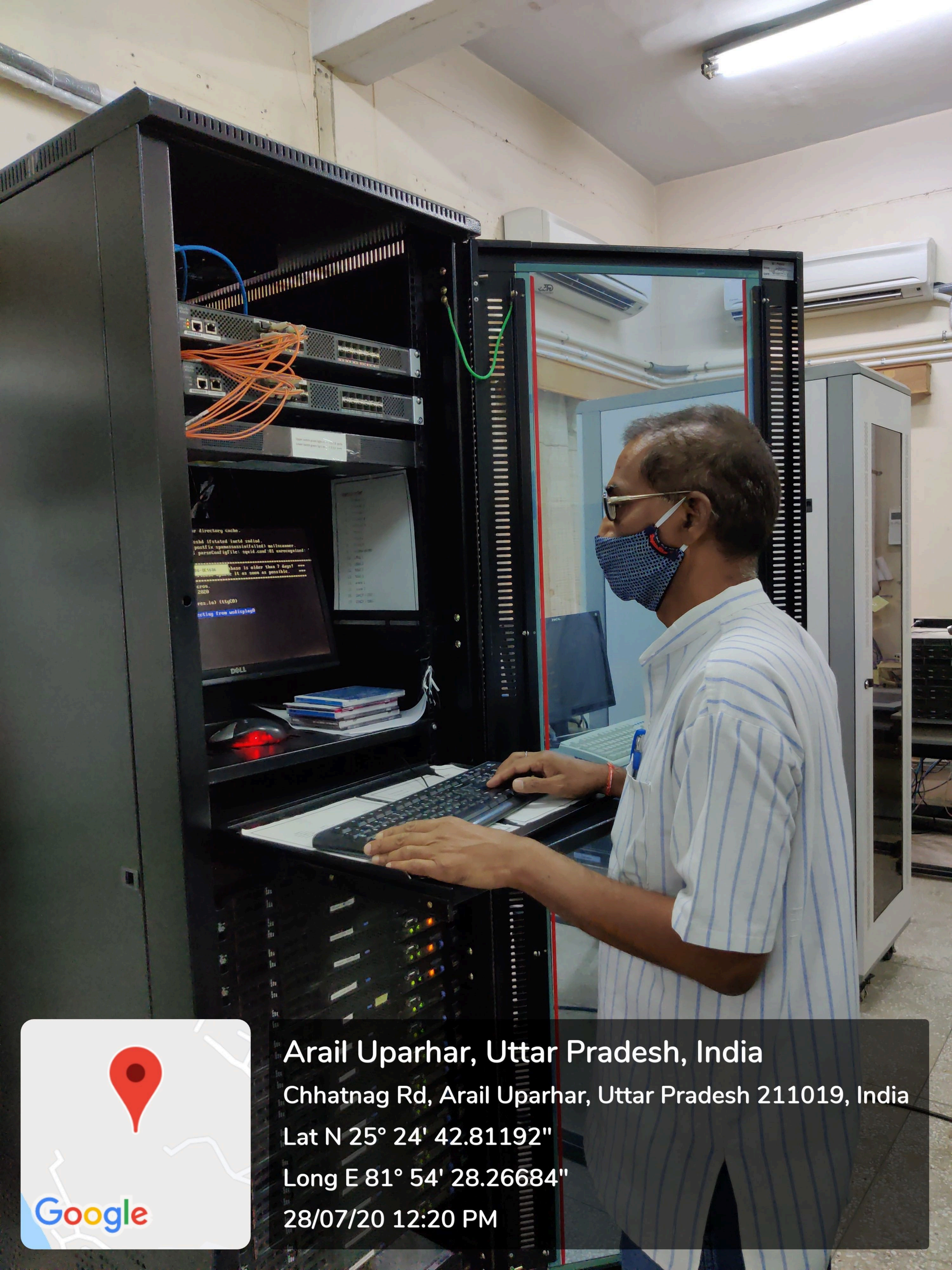












**Arail Uparhar, Uttar Pradesh, India**

**Chhatnag Rd, Arail Uparhar, Uttar Pradesh 211019, India**

**Lat N 25° 24' 42.81192"**

**Long E 81° 54' 28.26684"**

**28/07/20 12:20 PM**



Do Not Play GAMES, MUSIC In  
Computer Center/Conference Room/  
Common Machines.  
Users Are Also Requested Not To  
Download MOVIES, GAMES or  
Unnecessary APPLICATIONS/  
SOFTWARES  
THESE ARE NOT ALLOWED.



Arail Uparhar, Uttar Pradesh, India  
Chhatnag Rd, Arail Uparhar, Uttar Pradesh 211019, India  
Lat N 25° 24' 42.54516"  
Long E 81° 54' 28.62216"  
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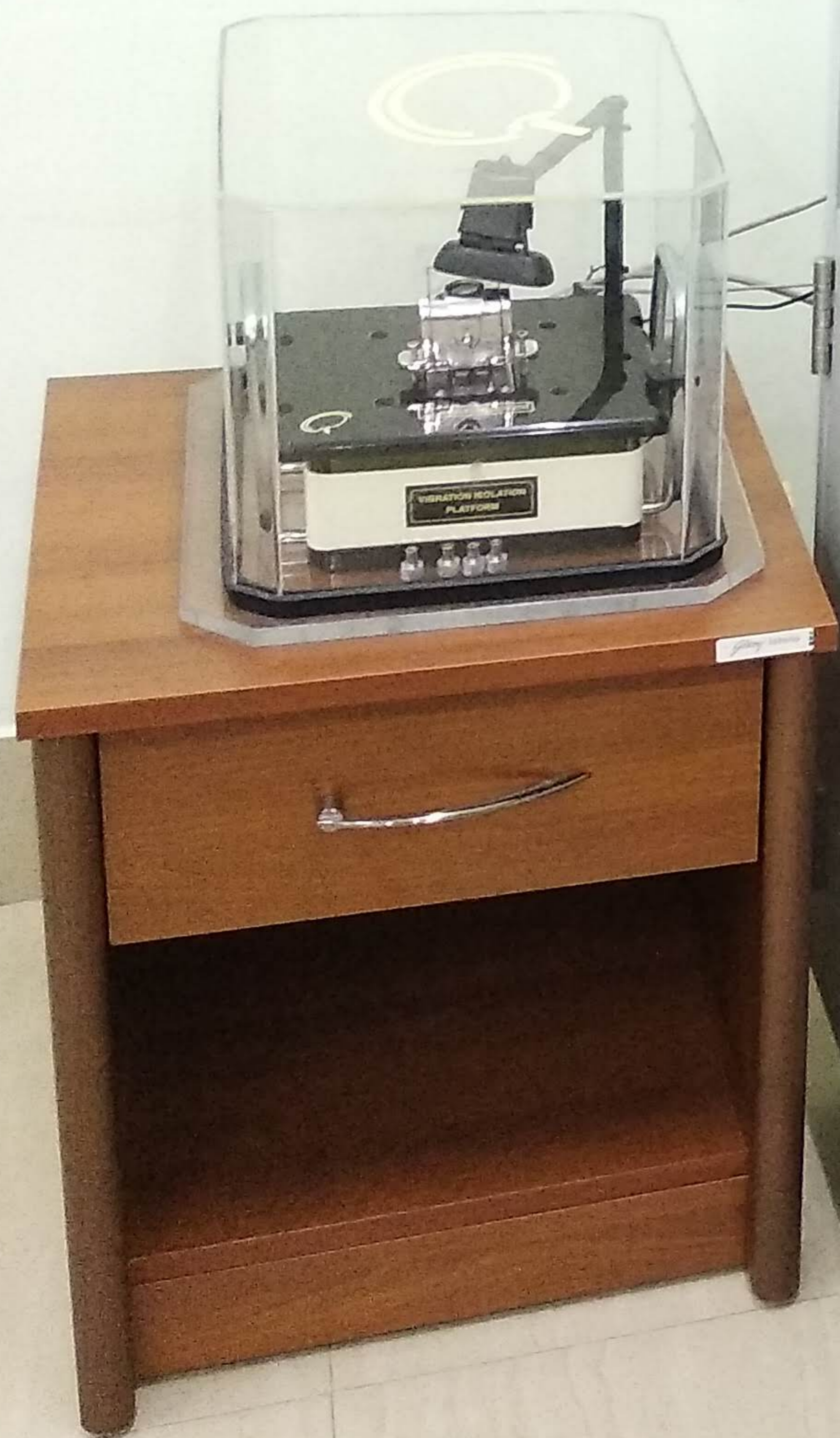




lambda scientific LIRA-300  
Laser Raman Spectrometer

**Raman Spectrometer**









भौतिकी प्रयोगशाला  
Physics Laboratory  
←



Arail Uparhar, Uttar Pradesh, India

Unnamed Road, Prayagraj, Uttar Pradesh 211019, India

Lat N 25° 24' 38.4498"

Long E 81° 54' 41.1246"

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**Arail Uparhar, Uttar Pradesh, India**

**Unnamed Road, Prayagraj, Uttar Pradesh 211019, India**

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**Long E 81° 54' 40.89204"**

**30/07/20 11:30 AM**





**Arail Uparhar, Uttar Pradesh, India**

**Unnamed Road, Prayagraj, Uttar Pradesh 211019, India**

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**30/07/20 11:30 AM**





**Arail Uparhar, Uttar Pradesh, India**

**Unnamed Road, Prayagraj, Uttar Pradesh 211019, India**

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**30/07/20 11:31 AM**





**Arail Uparhar, Uttar Pradesh, India**

**Unnamed Road, Prayagraj, Uttar Pradesh 211019, India**

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**30/07/20 11:31 AM**









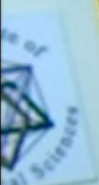
### 3. Photochemical reaction

- A) Electron transfer of hydrogen
- B) Hydrolysis
  - 1)  $H_2O + H_2 \rightarrow H_2O_2 + H_2$
  - 2)  $H_2O_2 + H_2 \rightarrow 2H_2O$
- C) Ionization
  - 1)  $H_2 \rightarrow H^+ + H^-$

- 1) Light contains a certain amount of particles "photons"
- 2.  $H_2 + h\nu$
- 3. Instability - may produce free light
- 4.  $H_2 \rightarrow H^+$













Am Hua Year Pe Lu

MON	5	12	19	26	
TUE	6	13	20	27	
WED	7	14	21	28	
THU	1	8	15	22	29
FRI	2	9	16	23	30
SAT	3	10	17	24	31
SUN	4	11	18	25	







# National Institute of Science Education & Research Bhubaneswar

## Annual Report

and

Audited Statement of Accounts



भारत 2023 INDIA



# 2022-2023

## New Research Facility

### School of Biological Sciences

- Automated Peptide Synthesiser (GYROS PROTEIN Technologies) @ CIF2A
- Metal Ion Imager (Zeiss) @ Imaging facility

### School of Chemical Sciences

- Glove Box Workstation EasyLab pro, Dielectric Impedance Analyser, Mass Spectrometer
- Stirred Reactor System, Microwave Synthesizer, Expression Compact Mass Spectrometer, P-series Binary HPCL with PDA Detector System with Accessories, Agilent 990 Micro GC System, Laser Head of Super Resolution Confocal Microscope etc.

### School of Computer Sciences

- Added Multi-GPU system at NISER for machine learning research

### School of Earth and Planetary Sciences

- Seismometers
- Thin section preparation Unit (partly)
- Polarizing Microscopes

### School of Humanities and Social Sciences

- Audio-visual facility in the SHSS conference room.

### School of Physical Sciences

- THz time-domain spectroscopy setup in the research lab of Dr. Shovon Pal
- Development of in-house Spin-orbit torque set-up in the research lab of Dr. Subhankar Bedanta.

- Development of in-house Spin-Seebeck effect set-up in the research lab of Dr. Subhankar Bedanta.

### Centre for Medical and Radiation Physics

- **Muography laboratory:** A laboratory for cosmic muon based imaging has been setup. The lab is being used for development of RPC based portable muon radiography setup. Development of detectors for muon tomography (used for high Z material identification) is also being explored.
- **MicroPattern-Gaseous-Detector (MPGD) laboratory:** An MPGD laboratory has been setup at CMRP where R & D on Micro Pattern-Gaseous-Detectors for single photon detection is being performed. The lab will be used for developing devices for medical imaging, particle physics research and social security purposes.
- **Silicon detector laboratory:** A silicon detector lab has been setup where Silicon Pad detectors and Silicon Photomultiplier detectors are being tested. R & D on silicon detectors for high energy physics and societal imaging applications will be carried out in this laboratory.
- **ISO-6 Cleanroom:** An ISO-6 cleanroom with approximately 300 sq. ft of area has been established with passbox facility. It is being used to assemble and test both MPGD and silicon detectors.
- **6 channel gas mixing system:** The 6-channel gas mixing system is being used for gas detector R & D. It is currently catering to both Resistive Plate Chamber detectors for Muography as well as MPGD detectors for imaging and particle physics research. It has the capability to mix 6 gases in desired proportions for use in gaseous detectors.
- **Fast digitizer and ASIC based frontend electron**