

# Indian Institute of Space Science and Technology

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Details of Instructional and Research labs  
under the  
**Department of Earth and Space Sciences**

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# 1 IIST Ponmudi Climate Observatory

- **Floor Area:** 56.3 sq m
- **Overall capital expenditure:** 1.34 Crore
- **Major instruments/ equipments:** 16-channel ( $>0.3\text{-}15\ \mu\text{m}$ ) Optical Particle Sizer (OPS), Condensation Particle Counter (CPC), Cloud Condensation Nuclei Counter (CCN), 7-channel (370-950 nm) Aethalometer, 6-stage (0.39-10.2  $\mu\text{m}$ ) high volume sampler, LiDAR Ceilometer (910 nm  $\pm 5\text{nm}$ ), Micro Rain Radar (MRR) (24 GHz), All Sky Imager (ASI), Surface Radiation Monitoring Station, Laser Distrometer, CO Analyzer, Automatic Weather Station (AWS)
- **Objective of the lab:** The IIST-PCO has been established as a cutting-edge research facility, concentrating on advancing our comprehension of weather and climate processes through extensive measurements of climate-quality data. Its primary objective is to provide high-quality, reliable aerosol and cloud parameters, which are essential for a comprehensive understanding of aerosol-cloud interactions, ensuring their accurate representation in weather and climate models. In addition, the data obtained from the instruments deployed at the site also serve the purpose of validating satellite products.

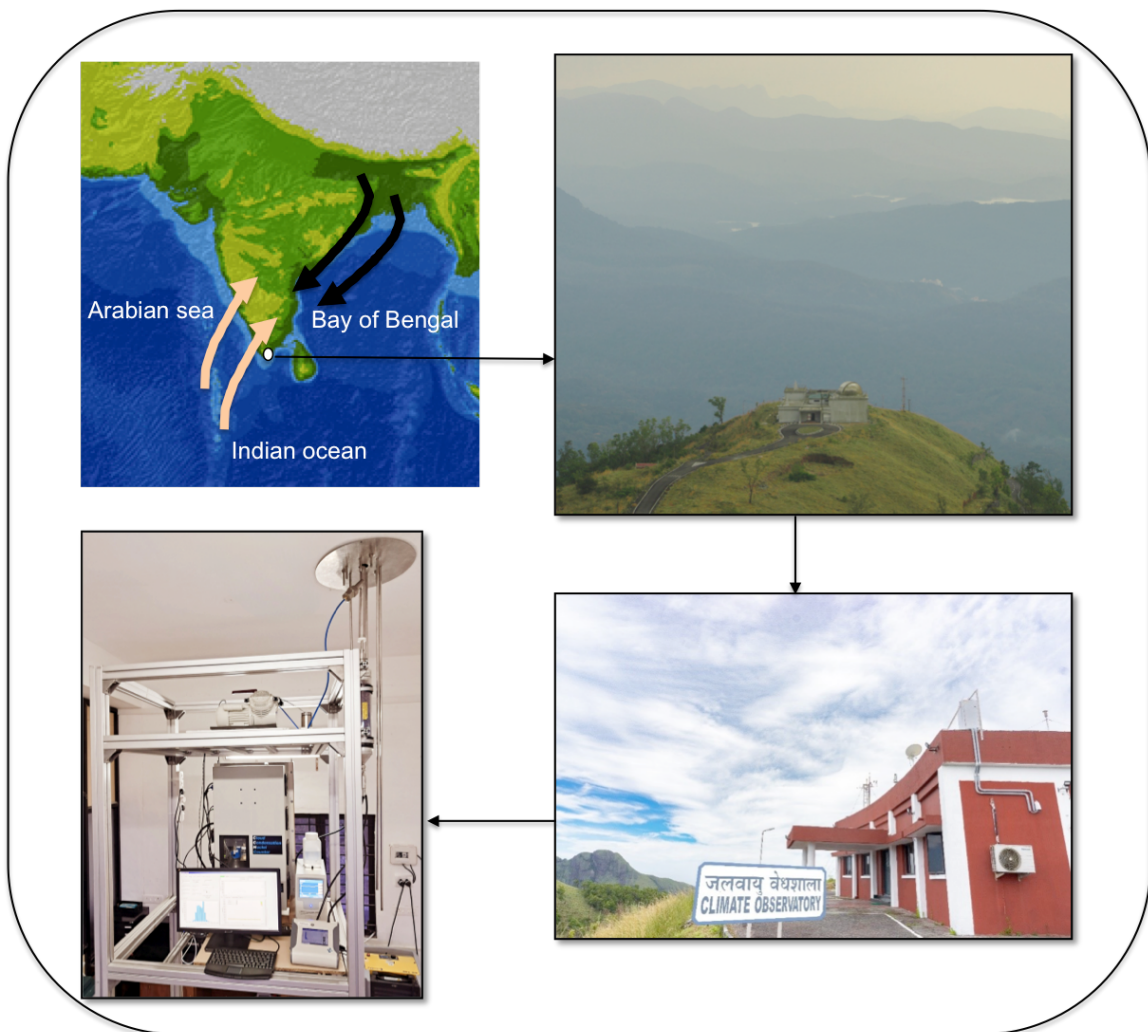


Figure 1: Geographical depiction of the IIST Ponmudi Climate Observatory.

## 2 Astronomy Observatory Lab

- **Floor Area:** 36 sq m
- **Overall capital expenditure:** 25 Lakhs
- **Major instruments/ equipments:** Telescopes, the dome, auxiliary equipment, and the CCD camera
- **Objective of the lab:** The Department of Earth and Space Sciences maintains an observatory supporting observational astronomy lab activities for undergraduate and postgraduate students. The facility is used for multi-band imaging and photometry of stars, and deep-sky objects.

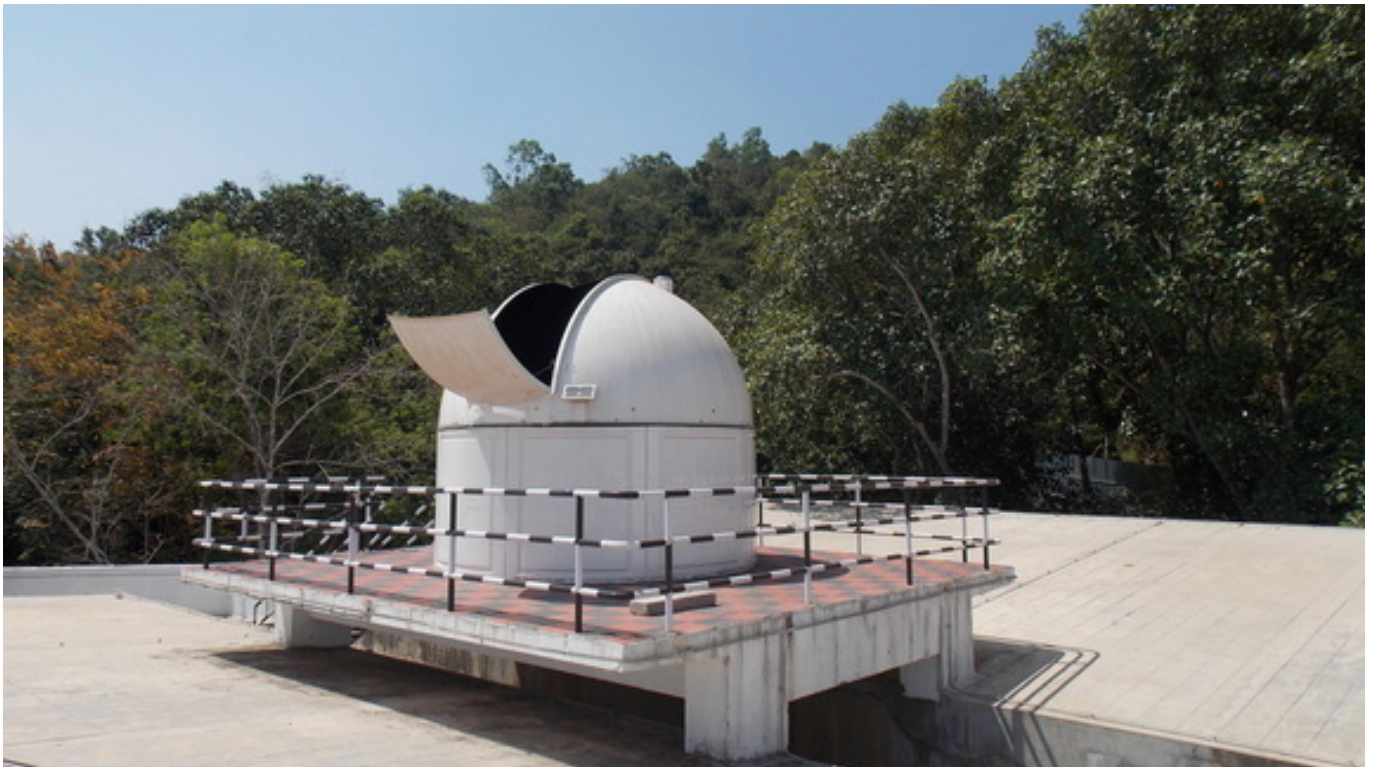


Figure 2: Astronomy Observatory Lab.

## 3 Atmospheric Science Lab

- **Floor Area:** 150 sq m
- **Overall capital expenditure:** 70 Lakhs
- **Major instruments/ equipments:** Standard meteorological instruments, and Workstations
- **Objective of the lab:** The goal to provide training and research opportunities for graduate and undergraduate students. The laboratory is equipped with the usual measuring equipment required for the development of analogue and digital electronic systems.



(a) Atmospheric Weather Station.



(b) Lab.

Figure 3: Atmospheric Science Lab.

## 4 Geology Lab

- **Floor Area:** 150 sq m
- **Overall capital expenditure:** 70 Lakhs
- **Major instruments/ equipments:** Advanced petrological trinocular microscope (Nikon Eclipse LV100), dedicated petrological microscope with heating and freezing stages, stereomicroscope, tabletop rock-cutting machine, handheld water quality meter and a deep freezing unit
- **Objective of the lab:** Our primary goal is to advance the understanding of geological processes on Earth and other planetary bodies. We aim to achieve this through comprehensive research and hands-on projects that focus on the formation, transformation, and characterization of minerals. This includes studying terrestrial analogues to infer the conditions and processes on Mars and Moon. The focus is on understanding these planetary bodies with the help of analogue studies. We also expand our research into fields such as astrobiology, terrestrial geology, and other allied fields.



Figure 4: Geology Lab.



(a)



(b)



(c)



(d)



(e)

Figure 5: (a) Nikon Eclipse LV100 advanced petrological trinocular microscope (b) Deep freezing unit for storing samples (c) Water quality meter (d) Hyperspectral analysis in dark room setup (e) Rock cutting machine.

## 5 Remote Sensing Lab

- **Floor Area:** 120 sq m
- **Overall capital expenditure:** 5 Crores
- **Major instruments/ equipments:** ASD Fieldspec3 Spectro radiometer, FARO Laser Scanner, UAV / Drone, Hyperspectral Imager, and software like ENVI 5.6, ERDAS IMAGINE 2018, ArcGIS 10.5.1
- **Objective of the lab:** The primary goal of the remote sensing laboratory is to establish itself as a leading research facility dedicated to leveraging space-based solutions for addressing real-world challenges. Additionally, the remote sensing lab seeks to produce skilled workforce capable of utilizing specialized hardware and software tools for managing geospatial datasets.



Figure 6: Remote Sensing Lab.