INDIA

Sonipat Atmospheric Observatory

Located in Delhi

Long-term CAS-INAR Collaboration

IIT Delhi, University Of Helsinki Agree For Academic Cooperation, Joint Research

Both institutes have agreed to establish a programme to collaborate in research, education, and planning, developing and testing new measurement technologies, and constructing and operating research infrastructure.

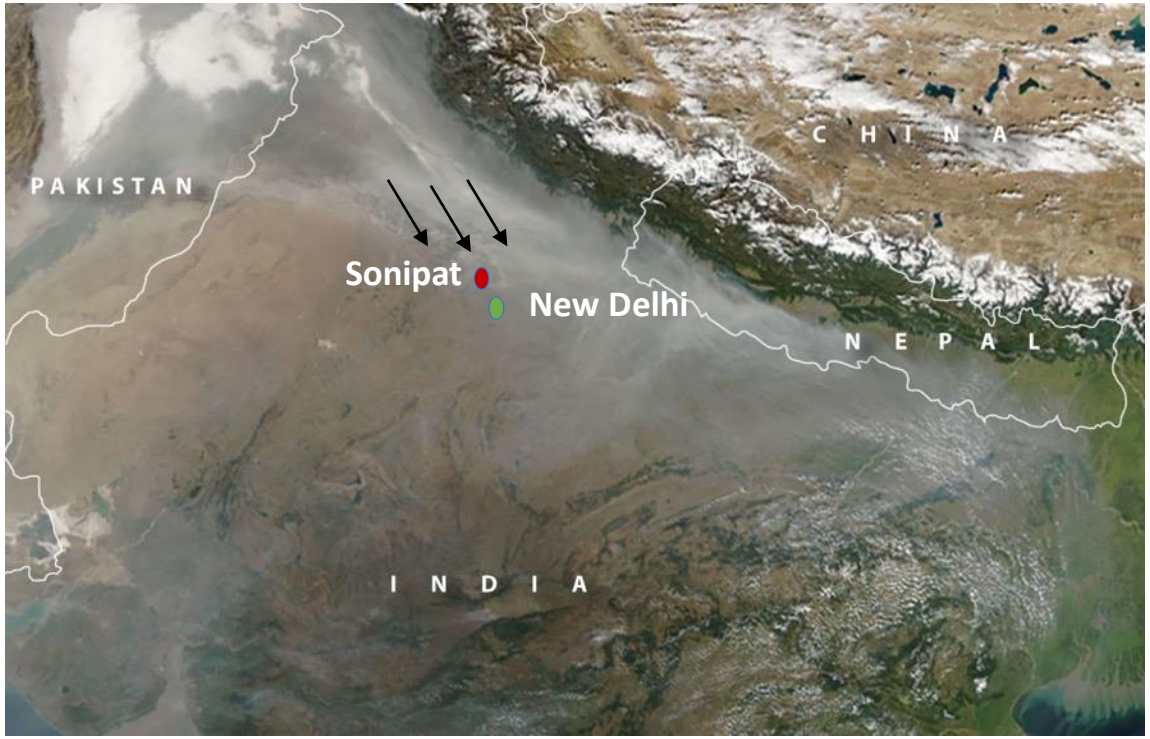
Education | Press Trust of India | Updated: Dec 15, 2022 5:07 pm IST

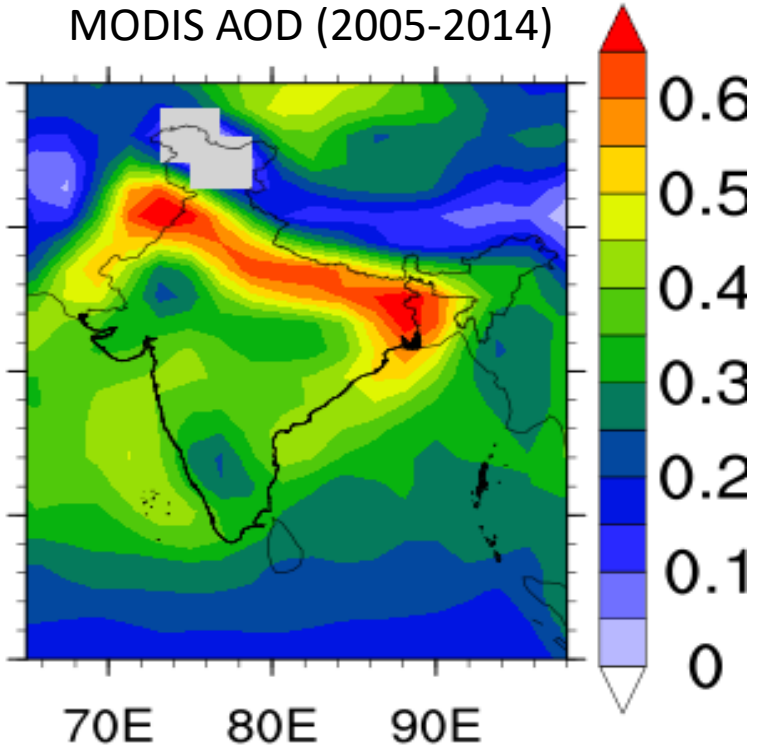
- **Science:** Advancing air pollution science with implications for evidence-based policy to reduce air pollution in a highly polluted and populated region, with climate co-benefits.

- **Capacity building:** Training researchers at a leading institute in South Asia in cutting-edge atmospheric measurement and analysis techniques.

- **Collaboration:** Building and engaging a network of domestic and international stakeholders working on themes related to air quality and climate change.

Atmospheric Observatory Sonipat Campus, IIT Delhi
Sonipat is located upwind of Delhi





Ideal location in the north Indian air pollution corridor as it not only experiences extreme levels of pollution but also acts as a gateway of pollutants from upwind locations in the middle-east, Pakistan, Punjab, and Haryana into the Delhi-NCR region.

GPS coordinates: 28°57'08.2"N 77°06'13.3"E

Why do we need an Observatory?

1. **Address key gaps in the observations over India**
   - Continuous long-term monitoring - Key to understanding daily variations in weather, air pollution and long-term climate change
   - Characterize air pollution levels in the full atmospheric column
   - Solar radiation measurement needed to better understand atmospheric chemistry and air pollution and effects on solar energy resources/generation
   - Cloud observatory to study cloud and rain processes
   - Improved satellite algorithms for retrieval of aerosol, cloud, rainfall, land surface parameters
   - Data needed for improving representation of clouds and rainfall processes in the weather and climate models
2. **Address policy needs**
   - Real-time source apportionment with actionable information for abatement strategies
   - Generate India-specific dose-response function for health impacts
   - Improved representation of key processes for improved model predictions of weather/climate/air pollution
   - Comprehensive understanding of India’s carbon budget and reducing uncertainty

Expected Outcomes

- **Cutting edge science**
- **Train personnel**
  - Scientific (post-docs, PhDs, Masters)
  - Technical
- **Relevance to society**
  - Provide answers (scientific / operational / technological / policy)
  - Raise awareness
  - Inspire

Laboratory Space

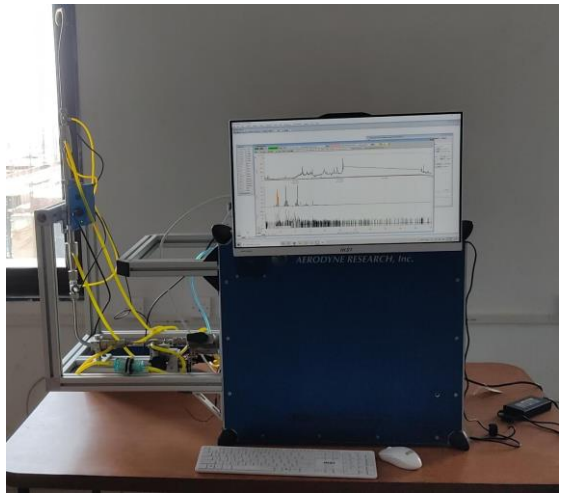
Air-Conditioned Room size: 100 m^2, Location: Top (Fourth) floor

Online measurements

NAIS

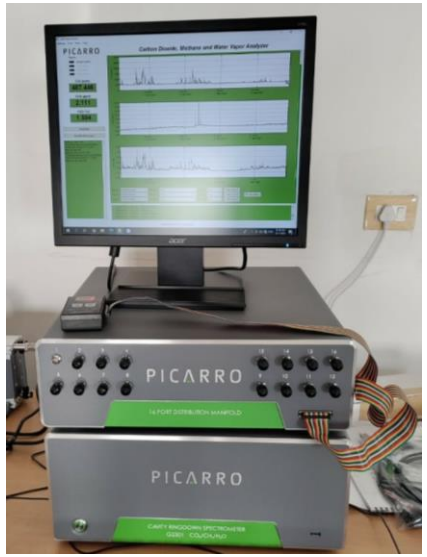
OPS + SMPS

ACSM



PM monitor

GHG analyzer



AWS

Ceilometer

AMOD

Online and Upcoming Measurements

Parameters	Instrument
Number size distribution of ions and particles	Neutral cluster and Air Ion Spectrometer: positive and negative ions 0.8– 42 nm; particles: 2.5–42 nm Scanning Mobility Particle Sizer + Optical Particle Sizer: 5 nm –10 µm
$PM_{2.5}$ composition	Aerosol Chemical Speciation Monitor
Black Carbon	**Aethalometer (required)**
Metals	**Xact Metal monitor (required)**
Particulate matter (mass concentration): PM_1, $PM_{2.5}$, PM_{10}, Total PM	Beta Attenuation, Monitor, Real time Environmental Monitor
Primary VOCs, SO_2	VOC, SO_2 analyzer
Greenhouse gas measurements: CO_2, CH_4, H_2O	Cavity Ring-Down Spectroscopy Gas analyzers
Meteorological parameters; Global, direct, and diffuse radiation	Automatic Weather Station with Pyranometer and Pyrheliometer
Aerosol optical depth	Aerosol Mass and Optical Depth sampler
PBL turbulence, mixing layer height, cloud height, aerosol profile	LiDAR Ceilometer

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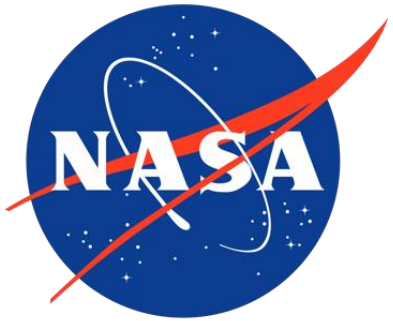
UNIVERSITY OF HELSINKI
FACULTY OF SCIENCE

INAR
INSTITUTE FOR ATMOSPHERIC AND EARTH SYSTEM RESEARCH

Commitments from National and International Programs



- AMOD Sampler (simultaneous AOD and $PM_{2.5}$) at Sonipat Campus
- AERONET and SPARTAN at the IITD main campus

- Equipment for ARFINET

- Scanning Spectral Radiometer (part of Skynet network)
- SAFAR network site (criteria pollutants)