



Achievements

Inauguration of 3D-Printed Automatic Weather Station (3D-PAWS)

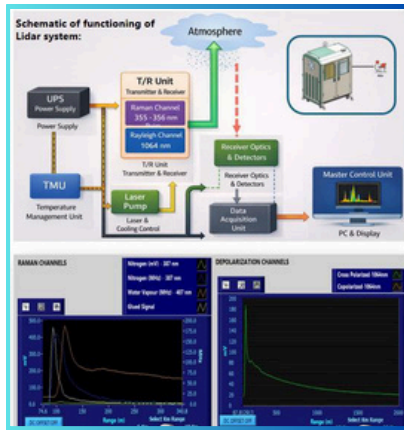
During the 151st Foundation Day celebrations of the India Meteorological Department (IMD), the 3D-Printed Automatic Weather Station (3D-PAWS), developed at the Indian Institute of Tropical Meteorology (IITM), Pune, was inaugurated at IMD Headquarters, New Delhi. The system was inaugurated by Honourable Minister... Jitendra Singh, in the presence of Dr. M. Ravichandran, Dr. A. Suryachandra Rao, and Dr. Mrutyunjay Mohapatra.

The 3D-PAWS represents a major advancement in indigenous scientific instrumentation, achieving nearly 90% cost reduction compared to similar commercial systems. Developed under Mission Mausam of the Ministry of Earth Sciences, in collaboration with the UCAR, USA, for the requirements of urban testbeds. The initiative strengthens India's weather and climate observation capabilities through scalable and cost-effective technologies, while enabling wider deployment of observational networks and integrated weather, climate, and air-quality monitoring. A laboratory is established at IITM and is equipped for the sustainable development of 3DPAWS.



Inauguration of India's first indigenous 3D-Printed Automatic Weather Station (3D-PAWS) at IMD Headquarters

Advanced Indigenous Aerosol LiDAR System Commissioned at IITM ART Facility



An indigenously developed dual-wavelength aerosol LiDAR system was commissioned in February at the IITM Atmospheric Research Testbed (ART) facility in Silkheda, Central India. Developed by the Instruments Research and Development Establishment (IRDE), DRDO, in collaboration with the India Meteorological Department (IMD), the system enables advanced aerosol profiling. Its observations will be validated using co-located measurements, enhancing capabilities for aerosol characterization and atmospheric research.

Installation of a Ceilometer at IMD Bikaner for the study of dust impact on cloud microphysics and lightning:

IITM, Pune, Ministry of Earth Science has initiated a three-year observational campaign, starting in 2026 across western Rajasthan to understand the impact of dust on cloud microphysics and lightning. For this, five locations such as Jaisalmer, Jodhpur, Barmer, Bikaner, and Churu have been selected for the study. As a part of this initiative, a depolarization ceilometer has been installed on 28th February 2026 by IITM at the IMD Bikaner station to continuously monitor aerosol and cloud properties



Observational system at Maitri, Antarctica

After the successful physical hardware integration and installation of Spherical Maxwell Antenna and Gerdien Apparatus at Maitri, Antarctica, the data acquisition systems have been completely validated for the Winter season by the first week of March. The observational system is now operational and continuously recording Global Electric Circuit (GEC) parameters through the Antarctic winter period. The GEC data gathered from the poles will be used to study its linkage with lightning activities over the Asian region.

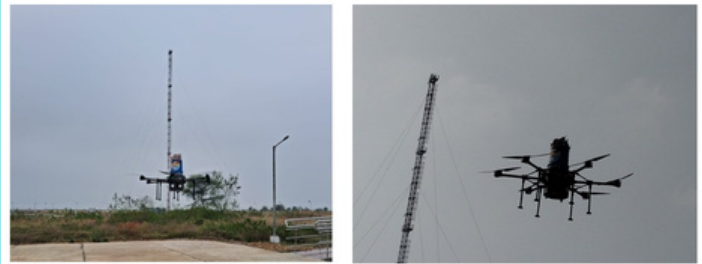


Spherical Maxwell Antenna and Gerdien Apparatus at Maitri, Antarctica

Lower Atmospheric Research Using Unmanned Aerial System Facility (LARUS)

An in-house designed aerosol sampling inlet system has been developed for UAV platforms to enable efficient aerosol collection during flight operations. The system is engineered to minimize sampling losses and mitigate disturbances caused by complex airflow around the UAV, ensuring representative measurements across varying altitudes and environmental conditions. Its compact and lightweight design allows seamless integration with UAV platforms without significantly impacting flight performance, making it well-suited for atmospheric and environmental monitoring applications.

Lower Atmospheric Research using Unmanned Aerial System Facility (LARUS)



LARUS: Drone experimentation at ART-CI along side 72m Tower for inter comparisons

Credit: IITM, Pune

Global Forecast System for Short Range Forecast

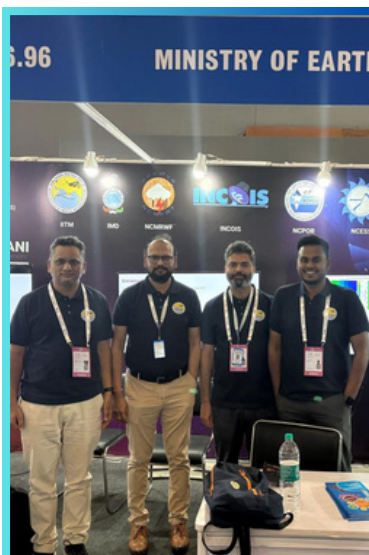
Automation of the entire BharatFS operational forecast workflow on HPCS ARKA, including copy from HPCS Arunika, model forecast and post-processing code submission, extraction of variables and generation of plots has been completed. This activity ensures that daily forecast outputs are automatically available on the IMD website without delay, improving the speed and consistency of the forecast system. The variables are extracted from the forecast and are made available at the Atmospheric Research Data Center (ARDC) server at IITM, Pune.

Developing a Multi-Scale Kain-Fritsch (MSKF) based Bharat Forecast system and conducted the reforecast of BharatFS for JJAS 2025 with MSKF. The verification for this experiment has been carried out. The reforecast runs for past years are being done.

IITM Participation in India AI Impact Summit 2026

Scientists from the IITM, Pune Dr. Phani Murali Krishna, Dr. Siddharth Kumar, Dr. Deepesh Jain, and Mr. Vaisakh participated in the India AI Impact Summit 2026 held from 16–20 February at Bharat Mandapam. They showcased the Ministry of Earth Sciences' advancements in AI/ML applications across weather, climate, ocean, and Earth system sciences.

The summit brought together researchers, policymakers, and industry experts to deliberate on the transformative role of Artificial Intelligence, fostering insightful discussions, strategic collaborations, and innovation-driven engagements aligned with India's AI vision.



Closure Meeting of the Urban-National Super Computing Mission (Urban-NSM) project

IITM successfully conducted the Urban-NSM Project Closure Meeting on 20th March 2026.

Initiated in 2018, the Urban-NSM project represents a collaborative consortium effort among the Centre for Development of Advanced Computing (C-DAC), IITM, and Automotive Research Association of India (ARAI). Over the course of eight years, the project has made significant progress in advancing scientific research toward operational applications, with a focus on delivering actionable solutions for end users. The project successfully developed early warning systems for extreme events, including rainfall, urban flooding, and air pollution, across multiple cities in India. The closure meeting was convened to present the project's key outcomes, achievements, and deliverables to stakeholders, domain experts, and consortium partners. A dedicated brainstorming session with stakeholders provided valuable insights into user requirements and future enhancements. The meeting concluded successfully, marking the culmination of a significant collaborative effort in strengthening urban environmental management.



Group photo of the Urban-NSM Project Closure Meeting

Brainstorming Workshop on Atmospheric Research Testbed (ART) Observations for Process Understanding and Model Improvements, 9–10 February 2026

IITM organized a brainstorming workshop on "Atmospheric Research Testbed (ART) Observations for Process Understanding and Model Improvements" at the ART facility in Silkheda, Sehore District, Madhya Pradesh. Inaugurated by the Hon'ble Secretary of the Ministry of Earth Sciences, the workshop brought together experts from observational, data assimilation, and modeling groups across India to discuss targeted observations, process-level understanding, data assimilation, verification, and numerical weather prediction model development. A panel discussion focused on the current status, future strategies, and research gaps in testbed observations for improving model and process understanding.





Participants and delegates of the Brainstorming Workshop



Lower Atmospheric Research Using Unmanned Aerial System Facility (LARUS)

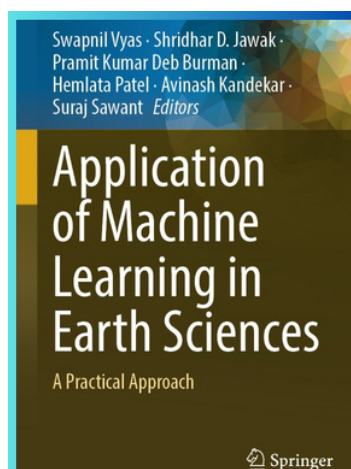
An in-house designed aerosol sampling inlet system has been developed for UAV platforms to enable efficient aerosol collection during flight operations. The system is engineered to minimize sampling losses and mitigate disturbances caused by complex airflow around the UAV, ensuring representative measurements across varying altitudes and environmental conditions. Its compact and lightweight design allows seamless integration with UAV platforms without significantly impacting flight performance, making it well-suited for atmospheric and environmental monitoring applications.

Book Launch

Application of Machine Learning in Earth Sciences

A new book titled *“Application of Machine Learning in Earth Sciences. A Practical Approach,”* co-edited by Prमित Kumar Deb Burman, Scientist–D at Indian Institute of Tropical Meteorology IITM, has been published by Springer Nature and was formally launched on 4 February 2026 during a national conference on Urban Rural Transformations organized by the Department of Geography at Savitribai Phule Pune University.

Dr. A. Suryachandra Rao, Director, IITM, attended the function as a Chief Guest and delivered the inaugural address, highlighting the significance of the book. The volume brings together 29 peer-reviewed chapters that provide a practical introduction to machine learning applications in Earth Sciences, covering key algorithms, tools, workflows, and case studies across domains such as climate analysis, forecasting, time series modelling, and multi-spectral data classification. It serves as a valuable resource for researchers, professionals, and students in academia, industry, and government. [Read More](#)



New MoUs signed by IITM

IITM–CMCC MoU on AI for Climate Modelling

IITM and the CMCC Foundation Euro-Mediterranean Center on Climate Change signed a Memorandum of Understanding (MoU) on 26 January 2026 to advance climate modelling using artificial intelligence. The agreement, formalised in the presence of Dr. Antonio Navarra and Dr. A. Suryachandra Rao, aims to strengthen research collaboration, promote scientific exchange, and enhance predictive capabilities for climate resilience.



IITM–CMCC MoU Sign

MoU Signed to Strengthen Lightning Monitoring in Maharashtra

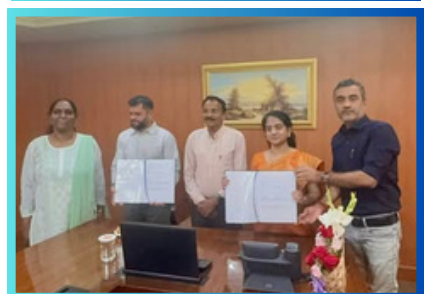
IITM has signed an Memorandum of Understanding (MoU) with the Sant Longowal Institute of Engineering and Technology (SLIET), Longowal, Punjab, for the installation of a Lightning Detection System under the Indian Lightning Location Network (ILLN) for a period of five years. The MoU was formally signed on 6 February by Vinu Valsala on behalf of the Director, IITM, and Mani Kant Paswan. This collaboration marks an important step toward strengthening India’s national lightning detection infrastructure and enhancing scientific capabilities in atmospheric monitoring.



IITM and Sant Longowal Institute of Engineering and Technology signed an MoU

Establishment of Bharat Climate Observation Network (BCON)

IITM signed an MoU with Bikaner Technical University (BTU) on 20 February 2026 for 50 years. Signed by Dr. A. Suryachandra Rao and Akhil Ranjan Garg, it supports climate research, long-term observations, and a Climate IITM signed a landmark MoU with Bikaner Technical University on 20 February 2026 for a period of 50 years, marking a significant step toward advancing climate research and long-term environmental observations in India. The collaboration aims to strengthen scientific understanding of climate change through sustained monitoring of meteorological parameters and climate-active trace gases, including greenhouse gases and short-lived climate forcers. A major achievement under this partnership is the establishment of a Climate Observation Station in Bikaner as part of the Bharat Climate Observation Network (BCON). The initiative will contribute to the generation of long-term, high-accuracy climate datasets essential for frontline climate research, climate services, and improved understanding of regional and national climate variability and change.



IITM and Bikaner Technical University signed a 50-year MoU

Climate Risk Assessment Partnership: IITM & RBI Collaboration

In a significant step towards integrating climate science with financial risk assessment, IITM and the Reserve Bank of India (RBI) have signed a MoU on 16th March 2026 (for the next 3 years; further extendable with mutual consent) to enhance collaboration in climate risk research and data development. This MoU aims to establish institutional cooperation between IITM and RBI to support the development of the Reserve Bank Climate Risk Information System (RB-CRIS).

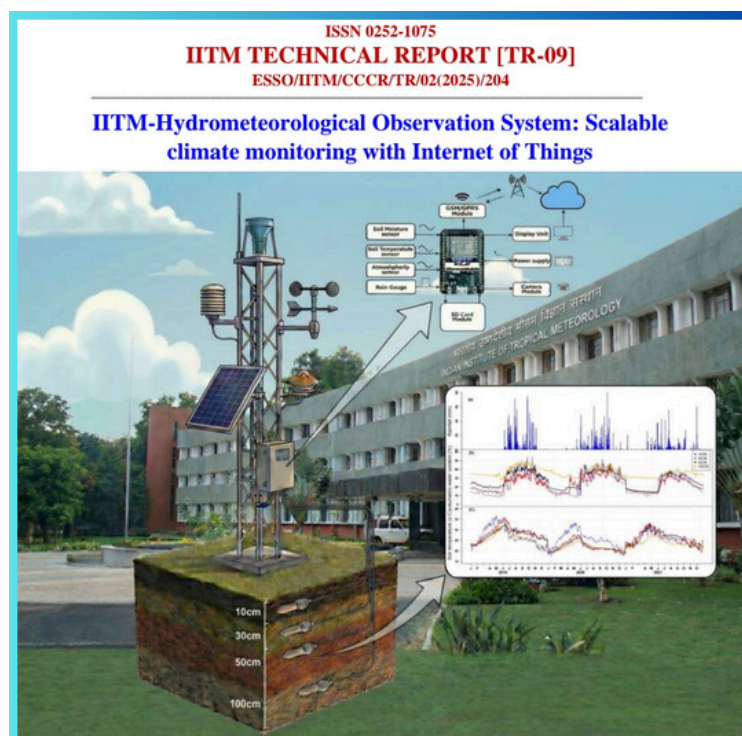


IITM & RBI Collaboration

New Reports

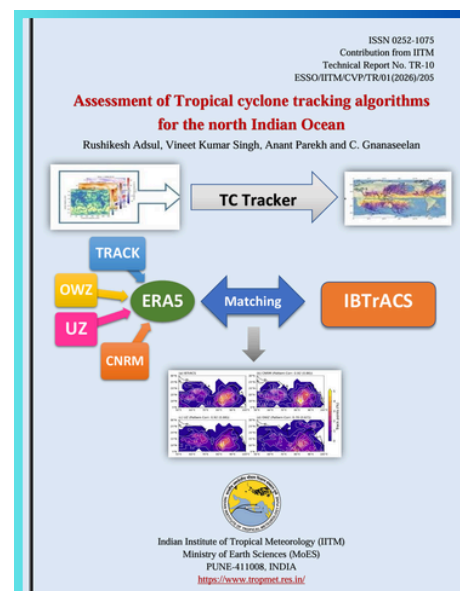
Technical Report on IITM Hydrometeorological Observation System

IITM has released a technical report titled “IITM-Hydrometeorological Observation System. Scalable Climate Monitoring with Internet of Things.” The study presents an IoT-based monitoring system deployed at the IITM-COSMOS site, Pune, enabling real-time, multi-depth observations of soil moisture and climate variables. Built on a modular ESP32-based architecture, the system integrates multiple sensors and uses BLE, GSM/GPRS, and Wi-Fi for reliable data transmission, supported by solar and battery power. It enhances data representativeness, ensures quality through alert mechanisms, and demonstrates applications in climate science, agriculture, water management, and environmental research. [Read Full Report](#)



Technical Report on Tropical Cyclone Tracking Algorithms for the North Indian Ocean

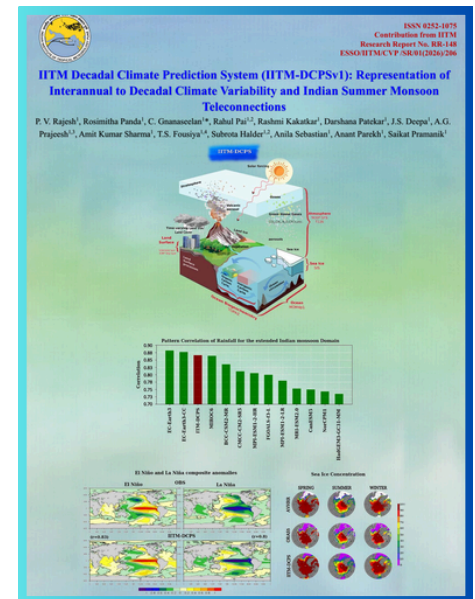
IITM has published a technical report titled “Assessment of Tropical Cyclone Tracking Algorithms for the North Indian Ocean” by Rushikesh Adsul, Vineet Kumar Singh, Anant Parekh, and C. Gnanaseelan. The study evaluates multiple tracking algorithms using ERA5 reanalysis data (1990–2022) and shows that cyclone detection and tracking vary significantly across methods. Among the tested algorithms, CNRM performs best, with ~80% detection probability. TM has published a technical report titled “Assessment of Tropical Cyclone Tracking Algorithms for the North Indian by Rushikesh Adsul, Vineet Kumar Singh, Anant Parekh, and C. Gnanaseelan. The study evaluates multiple tracking algorithms using ERA5 reanalysis data (1990–2022) and shows that cyclone detection and tracking vary significantly across methods. Among the tested algorithms, CNRM performs best, with ~80% detection probability. [Read Full Report](#)



Research Report on IITM Decadal Climate Prediction System (IITM-DCPSv1)

IITM has published a research report titled “IITM Decadal Climate Prediction System (IITM-DCPSv1): Representation of Interannual to Decadal Climate Variability and Indian Summer Monsoon Teleconnections” by P. V. Rajesh, Rosimitha Panda, C. Gnanaseelan, Rahul Pai, Rashmi Kakatkar, Darshana Patekar, J. S. Deepa, A. G. Prajeesh, Amit Kumar Sharma, T. S. Fousiya, Subrota Halder, Anila Sebastian, Anant Parekh, and Saikat Pramanik.

The study evaluates IITM-DCPSv1, developed from IITM-ESMv1, demonstrating improved land–atmosphere coupling, enhanced physical parameterizations, and better representation of climate variability. The model shows reduced biases, realistic simulation of monsoon dynamics, and accurate representation of major climate modes such as ENSO, PDO, and AMO, strengthening its capability for reliable decadal climate prediction, particularly for the South Asian monsoon and its teleconnections. [Read Full Report](#)

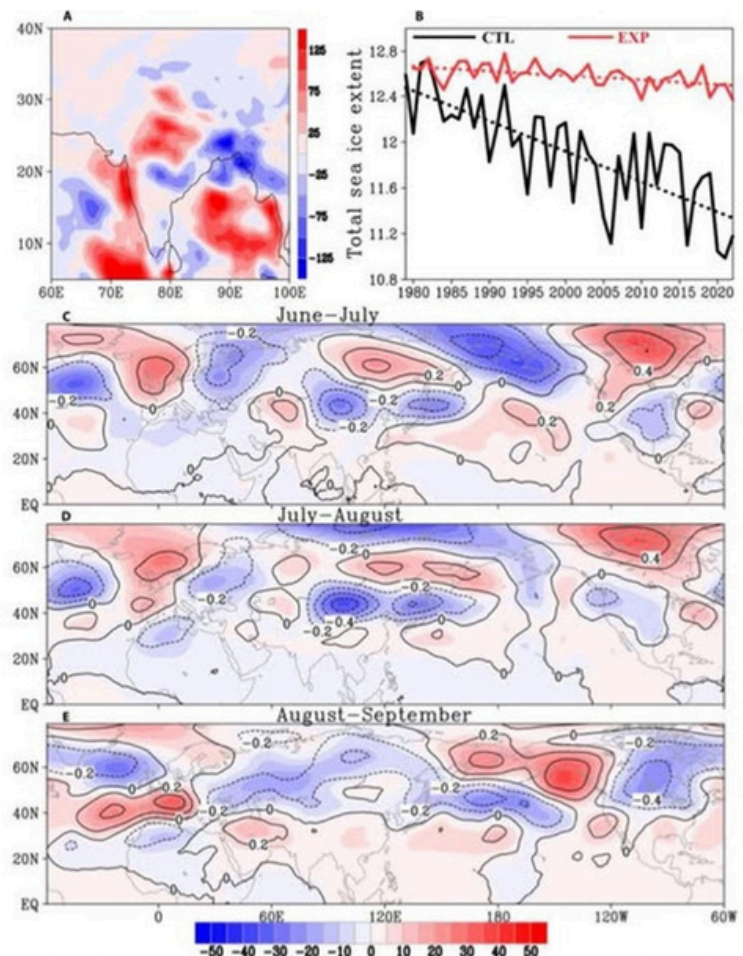


Research Highlights

Arctic Sea Ice Meltdown Enhances the South Asian Summer Monsoon Rainfall

IITM new study established a clear linkage between early summer Arctic sea ice decline and changes in late-season Indian monsoon rainfall. The analysis (1979–2022) indicated that reduced Arctic sea ice has been associated with enhanced rainfall over western and northwestern India, suggesting a westward shift in monsoon patterns. These findings highlighted the growing influence of polar climate changes on regional monsoon dynamics, with important implications for long-term climate adaptation and water resource planning (Chaudhari H.S., Saha Subodh Kumar, Pokhrel S., Rai A., Arctic Sea Ice Meltdown Enhances the South Asian Summer Monsoon Rainfall, Ocean-Land-Atmosphere Research, 5: 0129, January 2026, DOI:10.34133/olar.0129, 1-14).

Figure 1: (A) Change in model-simulated AS rainfall (in millimeters); CTL–EXP in the past 44 years (1979–2022). (B) Model-simulated Arctic sea ice extent (in million square kilometers) is shown by thick line (CTL, black; EXP, red) and their linear trends by dashed lines in the past 44 years (1979–2022).



The multi-year negative Indian Ocean Dipole of 2021–2022

The years 2021–2022 experienced an unprecedented multi-year negative Indian Ocean Dipole (nIOD), with the 2022 event being the strongest on record. The dipole mode index remained negative for approximately 19 months, marking the first sustained multi-year occurrence, coinciding with a triple-dip La Niña (2020–2022). This prolonged nIOD was driven by persistent westerly wind anomalies and frequent westerly wind bursts (WWBs) over the tropical Indian Ocean, likely influenced by the La Niña background state and enhanced convection. These anomalies intensified zonal currents and Wyrki jets, deepening the thermocline in the eastern Indian Ocean and sustaining nIOD conditions. Continued westerly activity in early 2022 acted as a bridge between successive events. This prolonged nIOD moderated Indian summer monsoon rainfall by counteracting favorable Walker circulation through anomalous subsidence over India associated with regional Hadley circulation adjustments. (Srivastava Ankur, Martin G.M., Pradhan M., Suryachandra A., Ineson S., *The multi-year negative Indian Ocean Dipole of 2021–2022, Weather and Climate Dynamics*, 7, January 2026, DOI:10.5194/wcd-7-1-2026, 1-15)

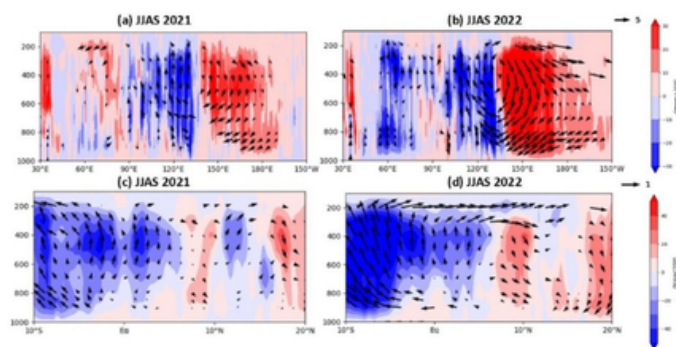


Figure 2; The height–longitude section of the anomalous JJAS mean Walker circulation (averaged over 1° S–1° N) for (a) 2021 and (b) 2022, and the height–latitude section of the anomalous JJAS mean Hadley circulation (averaged over 90–110° E) for (c) 2021 and (d) 2022. The vertical velocity (Ω) is scaled by 1000 and 2000 in (a, b) and (c, d), respectively, to elucidate the vertical motion. Vector magnitudes less than 10 and 5 are masked out in (a, b) and (c, d), respectively. The units are $m s^{-1}$ for the zonal component and $Pa s^{-1}$ for the vertical velocity.

In situ microphysics of multilayer clouds in the outflow regions of a low-pressure system during the Indian monsoon

Observations from CAIPEEX Phase-IV reveal the complex vertical structure of monsoon clouds and the role of layered aerosols in shaping cloud microphysics over India’s rain-shadow region. Three distinct layers were identified: a polluted boundary layer cloud, a cleaner mid-level cloud, and a polluted upper-level cloud. Aerosol stratification significantly influenced warm cloud properties, including droplet size, liquid water content, and number concentration. The mid-level cloud, formed under extremely clean conditions ($CDNC < 20 cm^{-3}$), exhibited broader drop and particle size distributions compared to the more polluted layers. The upper cloud layer contained abundant dendritic ice particles (300–3000 μm), with a layer of supercooled drizzle beneath, leading to aircraft icing. These findings highlight the importance of vertical aerosol distribution in modulating cloud microphysics and provide valuable constraints for improving weather and climate models. (Malap N., Patade S., Murugavel P., Prabhakaran Thara., *In situ microphysics of multilayer clouds in the outflow regions of a low-pressure system during the Indian monsoon, Atmospheric Research*, Volume 331: 108630, February 2026, DOI:10.1016/j.atmosres.2025.108630, 1-13).

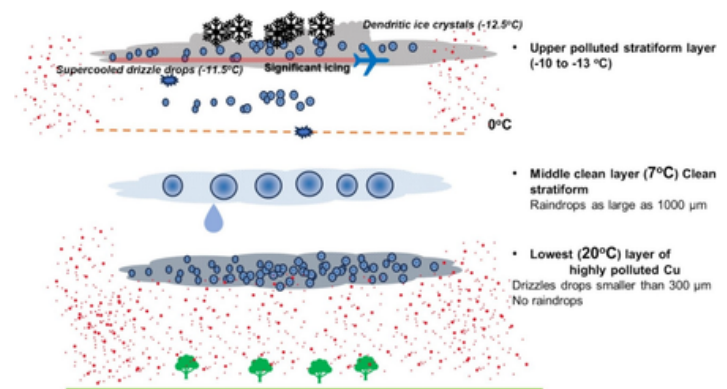


Figure 3: Schematic illustration of aircraft-based microphysical observations conducted within multiple cloud layers at different altitudes

Oceanic drivers on declining monsoon rainfall and cloud cover over the Gangetic plains: a multi-basin perspective

This study investigates the role of multi-basin oceanic influences in shaping the observed decline in monsoon rainfall and cloud cover over the Indo-Gangetic Plains, highlighting the importance of inter-basin climate interactions for understanding regional monsoon variability. The Middle and Lower Gangetic Plain (MLGP) has experienced a significant decline in Indian summer monsoon rainfall (JJAS) during 1984–2016, indicating a weakening monsoon circulation with implications for water and food security. This decline is linked to elevated aerosol loading over the Indo-Gangetic Plains, which suppresses convection, and to basin-wide warming of the Equatorial Indian Ocean (EIO), which weakens the land–sea thermal gradient and reduces moisture transport. The resulting circulation anomalies, including large-scale subsidence over the MLGP, persist independently of ENSO influences. Coupled model simulations (ACCESS-CM2) reproduce these patterns, supporting the proposed mechanisms. Additional influences from the Equatorial Atlantic and Pacific further reinforce subsidence through wave-driven teleconnections. Overall, the combined effects of aerosols, EIO warming, and inter-basin interactions contribute to the observed drying trend, highlighting the need for multi-basin approaches to improve monsoon prediction and climate adaptation strategies. (Prabhu A., Arya S., Deshpande S.M., Pandithurai G., *Oceanic drivers on declining monsoon rainfall and cloud cover over the Gangetic plains: a multi-basin perspective*, *Climate Dynamics*, 64: 49, January 2026, DOI:10.1007/s00382-025-08027-6, 1-25)

Figure 4: Schematic representation of multi-basin influences driving MLGP monsoon rainfall variability during JJAS (1984–2016). a Conceptual diagram showing RWTs, (green arrows) originating from the EIO, EAO and EPO, modulating the SWJ dynamics (red) and inducing anomalous subsidence (blue) over the MLGP; significant correlation (shaded) of MLGP rainfall and SST is shown by yellow contours b Flowchart summarizing the coupled processes, including multi-basin SST influences, aerosol-convection feedbacks and their combined effect on reduced cloud cover and rainfall over MLGP

Frequent floods in the Yangtze River basin linked to a shifted Indian Ocean wave regime

The frequency of major summer monsoon floods in the Yangtze River Basin has increased markedly, with six events during 1992–2024 compared to one during 1960–1991. This rise is associated with a ~50% intensification of quasi-biennial variability in East Asian summer monsoon rainfall and river discharge, driven by enhanced tropical Indian Ocean wave activity under stronger ENSO forcing. Amplified westward-propagating downwelling baroclinic Rossby waves suppressed vertical mixing in the western Indian Ocean, sustaining anomalously warm sea surface temperatures. This warming enhanced convection and tropospheric heating, strengthening the western Pacific subtropical high via Kelvin wave processes and increasing moisture transport to the Yangtze Basin. Additionally, faster Rossby wave phase speeds facilitated seasonal phase-locking between Indian Ocean warming and monsoon variability, contributing to increased flood risk. (Dasgupta P., Nam S., McPhaden M.J., Kang D., Saranya J.S., Roxy M.K., *Frequent floods in the Yangtze River basin linked to a shifted Indian Ocean wave regime*, *Nature Communications*, Online, March 2026, DOI:10.1038/s41467-026-70940-z)

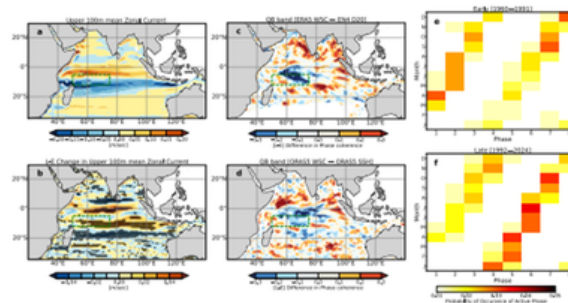
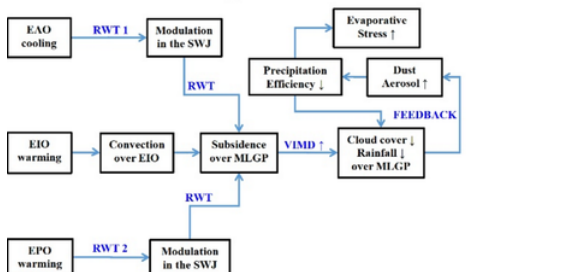
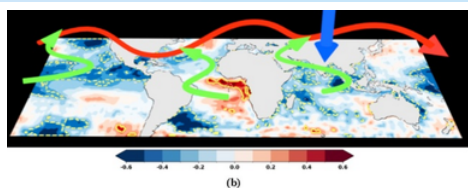


Figure 5: Differences in upper ocean (0–100 m) mean zonal currents and phase coherence with wind stress curl between Early (1960–1991) and Late (1992–2024) periods. (a) Upper ocean (0–100 m) mean zonal current. (b) Changes in mean upper ocean zonal current (Late–Early periods).

(c) Change in phase coherence between QB band ERA5 wind stress curl and QB band EN4 D20. (d) Change in phase coherence between QB band ORAS5 wind stress curl and QB band ORAS5 SSH. (e) Joint probability distribution of active CEOF1 phases (defined as CEOF1 amplitude > 25th percentile) across 8 CEOF phases and 12 calendar months

Aerosol iodine recycling is a major control on tropospheric reactive iodine abundance

Tropospheric reactive iodine plays a key role in atmospheric oxidation and ultrafine particle formation, yet its abundance and chemistry remain uncertain due to limited observations and incomplete model representation. This study improves iodine chemistry in the GEOS-Chem model by incorporating speciated aerosol iodine and iodide recycling mechanisms. Aerosol iodine is represented as soluble organic iodine, iodate, and iodide in fine and coarse modes, with iodide recycled into the gas phase through heterogeneous reactions forming I_2 , ICl , and IBr . This process doubles the tropospheric reactive iodine burden and improves agreement with observations. The conversion of aerosol iodine to reactive iodine is significantly faster than oceanic emissions and photolysis sources, highlighting the critical role of aerosols. Additionally, the inclusion of less reactive iodine species moderates iodide recycling, stabilizing iodine chemistry. (Moon A.R., Liu L., Wang X., Chan Y.-C., ..., Mahajan A.S., Alexander B., Aerosol iodine recycling is a major control on tropospheric reactive iodine abundance, *Atmospheric Chemistry and Physics*, 26, February 2026, DOI:10.5194/acp-26-2353-2026, 2353-2389)

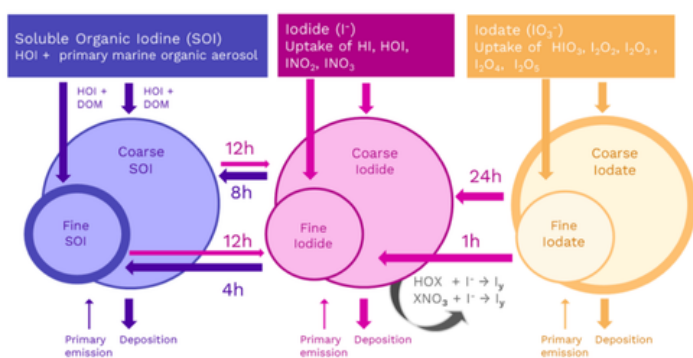


Figure 6: Schematic representing heterogeneous iodine chemistry in GEOS-Chem. Soluble organic iodine (SOI) is in blue, iodide is in pink, and iodate is in orange. Each aerosol iodine species has two size bins. Arrows moving toward each species represent a source while arrows moving away represent a sink.

Unveiling air toxicity in urban environment through morphology and chemical reactivity of aerosol: insights from Delhi

This study investigates the toxicity of urban aerosols in Delhi under high- ($PM_{2.5} \geq 300 \mu g m^{-3}$) and moderate-pollution ($PM_{2.5} \leq 100 \mu g m^{-3}$) conditions. Higher pollution levels were associated with elevated concentrations of organic and elemental carbon, secondary organic carbon, and inorganic species (SO_4^{2-} , NO_3^- , NH_4^+ , Cl^-), driven by enhanced primary emissions and atmospheric processes. Particle morphology showed diverse forms (irregular, fibrous, spherical), with compositions including carbonates, sulfates, quartz, and metal oxides. Sulfates differed between events, appearing as dense K-S-O in high pollution and Na-S-O in moderate conditions. Health risk assessment revealed higher excess cancer risk (ECR) during high-pollution events, particularly from Cr, Ni, and Co, with inhalation exposure significantly elevated. Overall, the findings highlight the strong link between aerosol composition, morphology, and toxicity in urban environments. (Pipal A.S., Rao M.N., Mukherjee A., Nivdange S.S., Roy C., Panicker A., Ghude S.D., Unveiling air toxicity in urban environment through morphology and chemical reactivity of aerosol: insights from Delhi, India, *Air Quality Atmosphere and Health*, 19: 8, January 2026, DOI:10.1007/s11869-026-01909-6, 1-15)

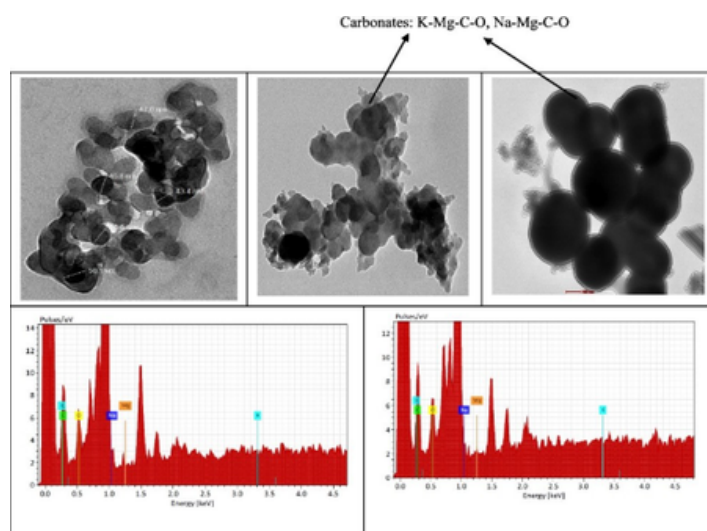


Figure 7: TEM image features and elemental composition of aggregate aerosol particles (PM1 and PM2.5)

Relative contribution of extreme and non-extreme rainfall to seasonal precipitation over Northwest India and the underlying mechanisms

This study examines the contribution of extreme rainfall events (EREs) to seasonal precipitation over Northwest India (NWI) and the associated dynamical drivers. Results show a ~10% increase in seasonal rainfall during 2000–2023 compared to 1971–2000, with EREs contributing over 75% of total rainfall across most of NWI and exceeding 90% in regions such as Punjab, Haryana, Rajasthan, and Gujarat. The increase is primarily driven by large-scale atmospheric circulation, particularly Rossby wave-induced trough elongation from Europe, modulated by jet stream configurations that facilitate downstream wave propagation. This leads to enhanced moisture transport from the equatorial Indian Ocean and Arabian Sea via a strengthened low-level jet, promoting deep convection. Supporting thermodynamic conditions, including elevated CAPE, moisture convergence, and moist static energy, further amplify convective activity. These findings highlight the growing dominance of extreme events in regional rainfall and their implications for hydrological and ecological systems. (Veesam Bhargavi, Jasti S. Chowdary, Gnanaseelan C., *Relative contribution of extreme and non-extreme rainfall to seasonal precipitation over Northwest India and the underlying mechanisms*, *Atmospheric Research*, 332:108711, March 2026, DOI: 10.1016/j.atmosres.2025.108711)

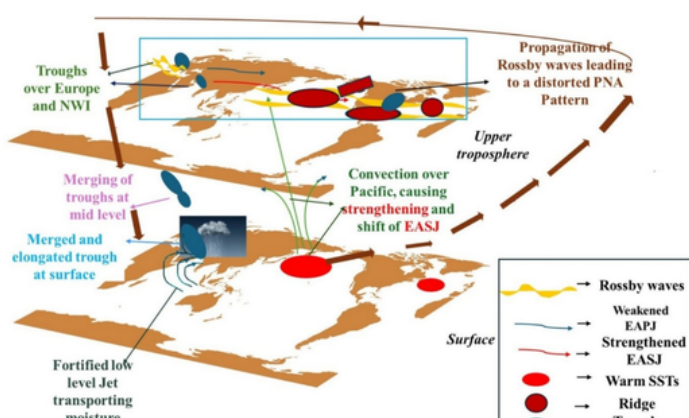


Figure 8: Graphical abstract

Estimation of location-specific precipitation using Deep Neural Networks

This study presents a paradigm shift by using Deep Neural Networks (DNNs) demonstrating superiority over the traditional methods like Kriging for station-specific precipitation approximation. A thorough analysis of identifying the best nearest neighbour approximation and computation time is carried out to ascertain the computational and methodological supremacy. We propose two innovative NN architectures: one utilizing precipitation, elevation, and location, and the other incorporating additional meteorological parameters like humidity, temperature, and wind speed. Trained on a vast data (1980-2019), these models outperform Kriging across various evaluation metrics (correlation coefficient, root mean square error, bias, and skill score) on a five-year validation set for any given location. This compelling evidence demonstrates the transformative power of deep learning for spatial prediction, offering a robust and precise alternative for hyperlocal precipitation estimation. (Kumar Bipin, Yadav B.K., Mukhopadhyay S., Rohan R., Singh B.B., Chattopadhyay R., Chilukoti N., Sahai A.K., *Estimation of location-specific precipitation using Deep Neural Networks*, *Theoretical and Applied Climatology*, 157: 223, March 2026, DOI:10.1007/s00704-026-06185-z, 1-17)

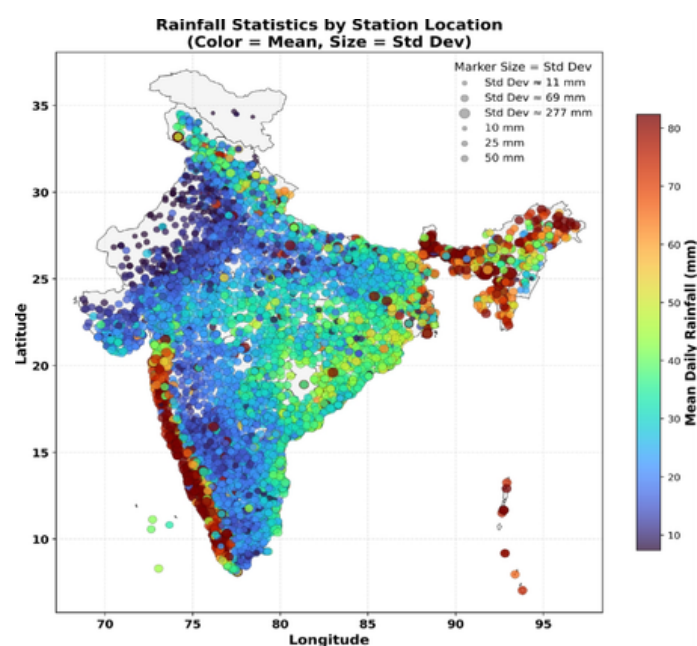


Figure 9: Representation of Mean rainfall value versus the standard deviation for the data obtained from NN_2 model

Coupled Influence of Aerosols, Convection and Cloud Microphysics on Lightning Across Diverse Climatic Regions of India

This study investigates the influence of aerosols, convective instability, and cloud microphysics on lightning activity across India using multi-satellite, reanalysis, and radiosonde data (2001–2023). Lightning activity shows strong spatial variability, peaking over northwest and northeast India and remaining lower over central and arid regions. Seasonal patterns align with convective available potential energy (CAPE), with maxima during pre-monsoon and monsoon periods. Aerosol optical depth (AOD) exhibits a non-linear relationship with lightning: moderate AOD enhances lightning under high CAPE ($>1000 \text{ J kg}^{-1}$), while excessive loading (>0.6) suppresses it, particularly under very high CAPE conditions. Aerosol type further modulates this response, with biomass-burning and urban aerosols enhancing lightning through microphysical invigoration, whereas dust and black carbon suppress it via atmospheric stabilization. Radiosonde and ERA5 data confirm increased mid-tropospheric heating and reduced vertical motion under high aerosol loading. Overall, the results highlight region-specific, non-linear aerosol-lightning interactions governed by thermodynamic conditions and aerosol characteristics. (Potdar S.S., Biswasharma R., Siingh D., Victor J.N., Singh R.P., Singh Shubha, Kamra A.K., *Coupled Influence of Aerosols, Convection and Cloud Microphysics on Lightning Across Diverse Climatic Regions of India*, *International Journal of Climatology*, Online, February 2026, DOI:10.1002/joc.70318, 1-20)

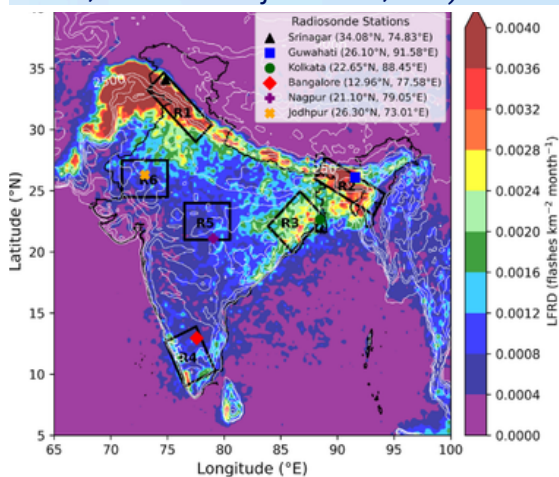


Figure 10: LFRD (flashes/km²/month) measured by TRMM-LIS (January 2001–April 2015) and ISS-LIS (March 2017–November 2023) over the Indian subcontinent. The study regions considered, named as R1–R6, are depicted by the boxes having an area of 12 degree². The contour lines show the altitude (m). The radiosonde stations (marked with different symbols) are as shown sri nagar (34.08°N, 74.83°E; region R1)

Guwahati (16.10°N, 91.58°E; region R2), Kolkata (22.65°N, 88.45°E; region R3), Bengaluru (12.96°N, 77.58°E; region R4), Nagpur (21.10°N, 79.05°E; region R5) and Jodhpur (26.30°N, 73.01°E; region R6) are also shown.

Evaluation of GFS T1534 hindcast precipitation skill over the Indian summer monsoon region,

This study evaluates the precipitation forecasting skill, variability, and systematic biases of the high-resolution Global Forecast System (GFS T1534, ~12.5 km) over the Indian summer monsoon (ISM) region using 19 years (2000–2018) of data. While the model reasonably captures global mean precipitation across lead times, it exhibits systematic wet biases over regions such as the equatorial Pacific, Atlantic, central Africa, and Maritime Continent, and dry biases over the western Pacific and equatorial Indian Ocean. Over the ISM region, precipitation is overestimated across Central India, Western Ghats, Indo-Gangetic Plains, and northeastern regions, but underestimated over the Bay of Bengal and eastern Indian Ocean. Probability distribution analysis shows overestimation of light-to-moderate rainfall and underestimation of heavy rainfall. The model underrepresents synoptic variability and overestimates intraseasonal variability, indicating deficiencies in physical parameterizations and ocean-atmosphere coupling. Skill scores decline rapidly with increasing rainfall thresholds and forecast lead time, becoming negligible beyond Day-3 for extreme events. These results highlight the need for improved model physics to enhance precipitation forecast accuracy. (Ganai M., Tirkey S., Krishna R.P.M., Johny C.J., Goswami T., Deshpande M., Mukhopadhyay P., *Evaluation of GFS T1534 hindcast precipitation skill over the Indian summer monsoon region*, *Climate Dynamics*, 64: 91, February 2026, DOI:10.1007/s00382-026-08072-9, 1-25)

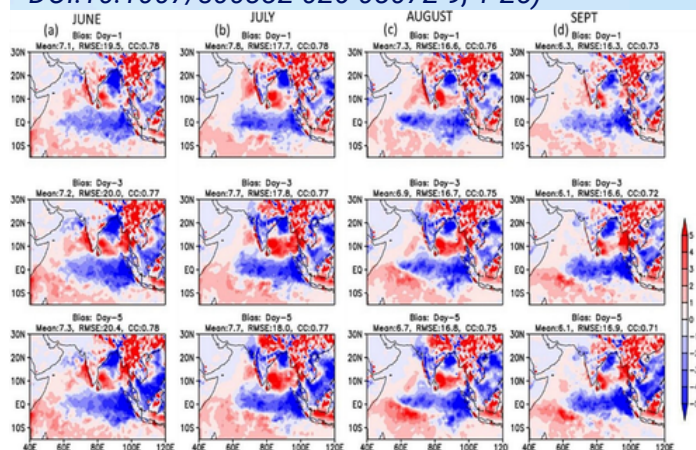


Figure 11: Monthly mean rainfall bias (mm day⁻¹) of GFS T1534 with respect to IMERG during a June, b July, c August and d September during 2000–2018 over the ISM domain. The domain-averaged mean, RMSE, and spatial CC are mentioned in all the plots

Quantifying the annual atmospheric CO₂ burden from biomass burning and its transport time to monitoring sites

This study quantifies the contribution of biomass burning to atmospheric CO₂ and its transport time using the NIES-TM model (2003–2019) with GFEDv5 and GFAS emissions across 16 biomes. The largest contributions were from Tropical & Subtropical Grasslands, Savannas and Shrublands (10.74 ppm) and Tropical Moist Broadleaf Forests (6.13 ppm). The global annual CO₂ burden from biomass burning was estimated at 1.5 ± 0.07 ppm yr⁻¹ (GFED) and 1.01 ± 0.08 ppm yr⁻¹ (GFAS). Trends indicate decreasing contributions in tropical biomes and increasing emissions in boreal forests. Biomass burning-driven CO₂ enhancements (>1 ppm) exceed ground-based detection limits and are detectable within 6–8 days, consistent with satellite uncertainties. These results highlight the importance of accurate fire emission inventories and support the use of ~7-day back-trajectory windows in atmospheric inversion studies. (Musaid P.P., Valsala V., Halder S., Tiwari Y.K., *Quantifying the annual atmospheric CO₂ burden from biomass burning and its transport time to monitoring sites*, Science of The Total Environment, 1011: 181202, January 2026, DOI:10.1016/j.scitotenv.2025.181202, 1-15)

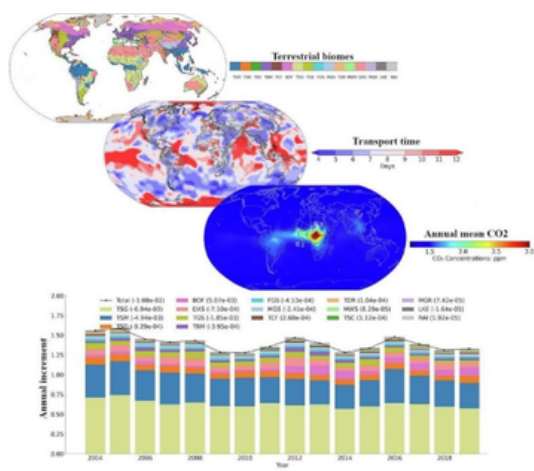


Fig 12: Graphical Abstract

Spatiotemporal Precipitation Nowcasting for Different Rain Types Using C-Band Dual-Polarimetric Radar Observations in Indian Core Monsoon Zone

This study evaluates radar-based rainfall nowcasting over the Core Monsoon Zone using a dual-polarization C-band radar and the PySTEPS framework. Three optical flow algorithms—Lucas-Kanade (LK), DARTS, and VET—are assessed across five rainfall categories ranging from light to extremely heavy events. Probabilistic nowcasts were generated using 24 ensemble members and evaluated using ROC and Fraction Skill Score (FSS). Results show comparable performance across methods, with DARTS performing slightly better for extremely heavy rainfall up to a 3-hour lead time. FSS decreases with increasing rainfall intensity and finer spatial scales, indicating reduced skill under extreme conditions. Overall, reliable nowcasting is achieved up to ~1 hour for light to moderate rainfall and up to 2–2.5 hours for higher intensity events. (Das Subrata K., Saini S., Kolte Y.K., Murali Krishna U.V., Deshpande S.M., *Spatiotemporal Precipitation Nowcasting for Different Rain Types Using C-Band Dual-Polarimetric Radar Observations in Indian Core Monsoon Zone*, IEEE Geoscience and Remote Sensing Letters, 23: 1000405, January 2026, DOI:10.1109/LGRS.2025.3636412, 1-5)

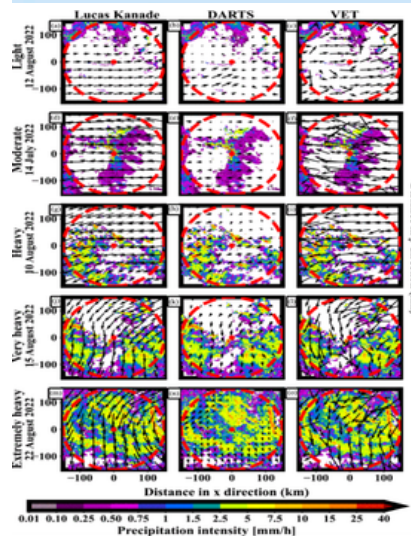


Figure 13: C-band radar precipitation intensity (color) and motion fields (vectors) for (a)–(c) light rain in August 12, (d)–(f) moderate on July 14, (g)–(i) heavy on August 10, (j)–(l) very heavy on August 15, and (m)–(o) extremely heavy on August 22, 2022. Motion fields were derived using 10 previous scans for (left) LK and (middle) DARTS, and 3 scans for (right) VET. The red dot indicates the radar location; the circle shows 150 km coverage.

Important Events

Prof. R. Ananthkrishnan Seminar Series

➤ **Prof. Ralf Zimmermann**, Chair of Analytical Chemistry at the University of Rostock, delivered the 89th Series on 05 January 2026. The lecture was titled “Single Particle Mass Spectrometry and Coupling of DRI EC/OC-Analyzer to Photo Ionization Mass Spectrometry: Novel Analytical Concepts for Addressing the Composition, Climate- and Health-Impact of Airborne Particulate Matter (PM) Aerosol Instrumentation.” [Youtube Link](#)



➤ **Prof. Umesh Ramakant Kadhane**, Associate Dean and Professor in the Department of Physics at IIST, Thiruvananthapuram, Kerala, delivered the 90th lecture series on “High Energy Radiation Processing in Planetary Upper Atmosphere: Understanding Molecular Origins of Life” on 16 January 2026. [Youtube Link](#)



➤ **Shri M. Mahakur**, Scientist E at IITM, delivered the 91st lecture under the Prof. R. Ananthkrishnan Colloquium on “Multi-scale Manifestation of ISMR as Evidenced from TRMM Precipitation Radar Observations” on 27 February 2026 [Youtube Link](#)



➤ **Dr. Taveen Singh Kapoor**, Postdoctoral Research Associate at the Center for Aerosol Science and Engineering, Department of Energy, Environmental and Chemical Engineering, Washington University in Saint Louis, delivered the 92nd lecture series on “Emerging Absorbing Atmospheric Aerosol: Dark Brown Carbon & Alumina” on 13 March 2026. [Youtube Link](#)



International Women’s Day 2026 was celebrated at the IITM, Pune, on 09 March 2026, bringing together scientists, researchers and staff to recognise the contributions of women in science and society. The event featured contributions of women scientists , a keynote talk by Dr. Monali Rahalkar, ARI, Pune; and a plenary talk from Mrs. Anuradha Prabhudesai, Founding President, Lakshya Foundation. It also highlighted a food fair conducted by small business women entrepreneurs, a cultural program, and a felicitation program, concluded by a light yoga and meditation session.



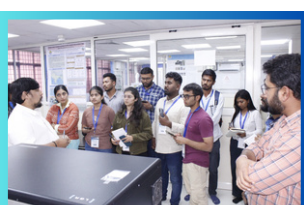


3rd Indian Quaternary Congress (IQC-2026)

The 3rd Indian Quaternary Congress (IQC-2026) was inaugurated on 21 January 2026 at the Indian Institute of Tropical Meteorology, Pune, bringing together around 200 participants to explore the theme “Tracing Earth System Dynamics and Human–Environment Interactions through the Quaternary.” M. Ravichandran, Secretary, Ministry of Earth Sciences, inaugurated the conference, with N. V. Chalapathi Rao as Guest of Honour, in the presence of A. Suryachandra Rao, Director, IITM, and other distinguished dignitaries. In his address, Dr. Ravichandran emphasized translating Quaternary research into actionable outcomes and encouraged collaborative project proposals, while Dr. Rao highlighted IITM’s strength in integrating climate modelling with paleoclimate research and announced wider public access to climate and paleoclimate datasets.

The three-day congress (21–23 January 2026) featured plenary lectures, keynote sessions, and thematic discussions spanning terrestrial, marine, and polar aspects of the Quaternary period. The scientific programme was structured around five major themes, including paleoclimate dynamics, ocean and cryospheric systems, human–climate interactions, modelling approaches, and biodiversity evolution.

A two-day pre-conference National Training Workshop on “Stable Isotopes in Palaeoclimatology” (19–20 January 2026) was conducted by DESK-IITM (MoES), complemented the congress by providing hands-on insights into isotope-based climate reconstruction techniques and their applications in understanding long-term climate variability and human–environment interactions. **Visit:** iqc2026.tropmet.res.in



Brainstorming Meeting on Indian Lightning Location Network (ILLN) at IITM, Pune

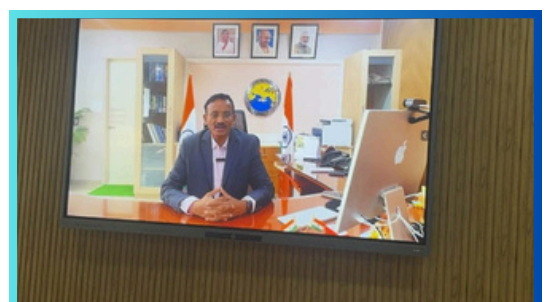
On 21 January 2026, a brainstorming meeting of the Indian Lightning Location Network (ILLN) was successfully held at the Indian Institute of Tropical Meteorology (IITM), Pune, bringing together scientists, policymakers, and stakeholders working in lightning detection and thunderstorm research. The meeting was attended by M. Ravichandran along with representatives from key national institutions including NRSC, NCMRWF, NESAC, NCESS, and disaster management agencies. Discussions focused on strengthening lightning detection networks, enhancing data utilization, and advancing impact-based forecasting and disaster risk reduction. The meeting served as a valuable platform for collaboration, knowledge sharing, and outlining future directions for lightning research and applications in India.



Republic Day 2026 – Pride, Leadership, and Service at IITM

A proud moment for the Indian Institute of Tropical Meteorology (IITM) and Indian science, as A. Suryachandra Rao represented the institute in New Delhi at the Republic Day ceremony on the invitation of Narendra Modi. Back at the IITM campus, the Republic Day flag hoisting ceremony was led by Anupam Hazra, reflecting national pride, continuity, and collective commitment. From the national capital to the institute, the occasion highlighted the trust placed in Indian science, leadership in action, and dedication to the nation.

A rare and proud moment for IITM, Pune, as A. Suryachandra Rao was invited as a Special Guest of the Government of India to the Republic Day Ceremony 2026. This distinguished recognition reflects his significant contributions to Earth System Sciences and highlights the growing impact and stature of Indian scientific research. The honour stands as an inspiration for the scientific community and underscores the nation's appreciation for excellence in science. [Youtube Link](#)



Knowledge Exchange Program on Urban Environment Challenges in Pune

On 11 February 2026, IITM, Pune, under the EIACP Programme of the Ministry of Environment, Forest and Climate Change (MoEFCC), in collaboration with the Confederation of Indian Industry–Centre of Excellence for Sustainable Development (CII-CESD), announced a One-Day Knowledge Exchange Program titled “Urban Environment Challenges in Pune & Way Forward,” to be held on 12 February 2026 (10:00 AM–5:00 PM) at Varahamihir Hall, IITM Pune.

The programme will be graced by Naval Kishore Ram as Chief Guest, A. Suryachandra Rao as Chief Patron, and Sunil Desai as Guest of Honour. It will convene experts, policymakers, and stakeholders to deliberate on sustainable, resilient, and science-driven urban development pathways.

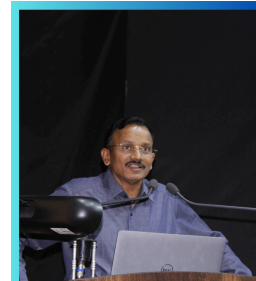
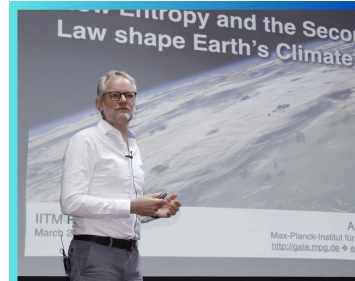


Atmospheric Thermodynamic Workshop (NT-ATW):

DESK has organized NT-ATW, jointly with Max Planck Institute at IITM Pune, during 16-18 March, 2026 with a goal to understand and brainstorm the potential of thermodynamic metrics in improving Earth system models over India with a specific focus on: 1. Land-atmosphere interactions; 2. Climate Change in the Himalayas, 3. Extreme rainfall and drying trends; 4. Indian monsoon in a changing climate.

Watch the Lectures on youtube link given below.

[Youtube Links of Day 1](#), [Day 2](#), [Day 3](#)



Training Programme: Leveraging Climate Data for Designing Climate Change Interventions

IITM hosted this Training Programme in collaboration with Bankers Institute of Rural Development (BIRD), Lucknow, from 9 to 11 March 2026. It was attended by 35 participants across India representing a wide range of government and non-government institutions, creating a vibrant platform for learning, dialogue, and collaboration on climate-informed interventions.



Science Popularization
Activities

National Science Day 2026 Open Day at IITM Pune

IITM, Pune, organized an Open Day on 27 February 2026 as part of National Science Day celebrations, engaging around 300 students from schools and colleges. The programme featured interactive sessions, Q&A discussions, and laboratory visits, offering hands-on exposure to weather, climate, and ocean sciences. Students explored key facilities including HPC, SAFAR, isotope labs, lightning network, wind tunnel, COSMOS, and others, gaining insight into ongoing research activities. The initiative aimed to promote scientific awareness and inspire young minds to pursue careers in science through direct interaction with researchers.



IITM Participation for National Science Day Celebration at GMRT

Participation at the Giant Metrewave Radio Telescope (GMRT), Khodad, Pune, marked a proud moment for the IITM. As part of the annual National Science Day celebrations, IITM contributed through interactive exhibits and live demonstrations, fostering engagement between science and society. The participation focused on sharing scientific knowledge, encouraging curiosity, and inspiring visitors, reflecting a meaningful effort in science outreach and public engagement.



A Special lecture series “Women in Science: Catalysing Viksit Bharat”

A Special lecture series in celebration of National Science Day 2026 was arranged on 02 March 2026 on the theme “Women in Science: Catalysing Viksit Bharat”. Dr. Thara Prabhakaran and Dr. Swapna Panickal delivered the talks.



World Meteorological Day

IITM celebrated World Meteorological Day 2025 on 23 March 2026. The event, themed “Observing Today, Protecting Tomorrow,” featured a lecture by Dr. Satish Shenoi, former Director of INCOIS, Hyderabad. His talk, “From Data to Safety: Observing Today to Protect Tomorrow in the Era of Climate Change,” focused on the rise in greenhouse gas emissions and their implications for climate monitoring and future resilience.



Feature in ET Edge Insights Bharat Forecast System

Dr. A. Suryachandra Rao, Director of Indian Institute of Tropical Meteorology, has been prominently featured in *ET Edge Insights* (Vol. 08, February 2026), a leading platform for science and technology leadership. The feature highlights the *Bharat Forecast System (BharatFS)*, developed at IITM under the Ministry of Earth Sciences, which is recognised as the world's highest-resolution global weather model. This milestone underscores India's growing leadership in advanced weather and climate science and reflects the Institute's contributions to global forecasting capabilities.

[Read here \(Page 58\)](#)



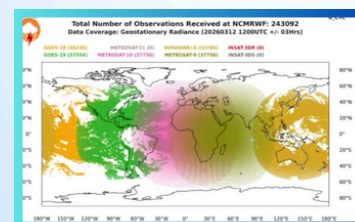
Outreach Activities

EIACP centre successfully conducted various activities in March 2026

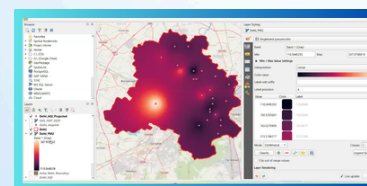
A one-day training programme on the **Capacity Building Programme on Solar Dehydration Training** was conducted at Sindgaon, Dist. Dharashiv on 11 March 2026. The was organised to promote sustainable food processing practices and livelihood opportunities through solar-based technologies. A total of 24 participants attended the training and actively engaged in the learning sessions.



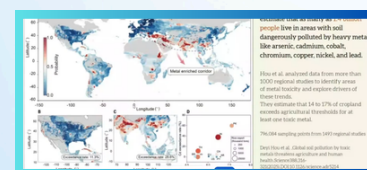
A **five-day online certificate course on "Satellite Data Analysis for Weather and Climate"** was organised in collaboration with CSEE from 13-17 March 2026. The program provided participants with comprehensive insights into the use of satellite observations for weather monitoring, climate analysis, and environmental applications.



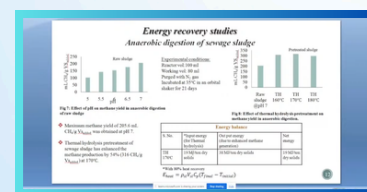
A **3-day Online certificate on "Air Quality Monitoring using GIS & Remote Sensing"** was held in collaboration with Harita Hive, from 16-18 March 2026. It provided participants with practical insights into data analysis, mapping techniques, and the integration of GIS in environmental monitoring systems.



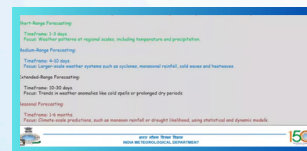
On **Global Recycling Day**, a webinar titled "Technology & the Informal Sector in the Recycling Ecosystem" was organized with the EIACP Centre at PPCC, Puducherry, on 18 March 2026 to connect research with grassroots insights and foster collaboration for a sustainable future.



World Water Day (22nd March 2026) & World Meteorological Day (23rd March 2026): A webinar "World Water & Meteorological Day Special: Climate Trends, Water Resources, and the Path Forward" was held on 24 March 2026 in collaboration with the EIACP Centre at the Environment Protection Training & Research Institute, Hyderabad.



The event aimed to connect research with grassroots insights to foster collaboration between innovation and the informal sector for a sustainable future.



All EIACP centres were invited to the **National Evaluation Workshop 2025-26** in Delhi. A detailed presentation on annual activities was presented to MOEF&CC officials and external experts on 17 March 2026, with monthly reports and newsletters were sent for review.



A Public Survey on Air Pollution & Climate Change was conducted across various areas of PMC and PCMC.

IITM Participations in Important Meetings/ Events

- » A discussion on cloud seeding was held with members of Bhavatal, an organization engaged in science awareness and citizen science activities, during their visit to IITM on 18 March 2026 under the “Vigyan Jigyasa” program. The session included a talk in Marathi on cloud seeding, followed by interactive discussions addressing queries related to cloud seeding and cloud physics.
- » A discussion meeting was held on 23 March 2026 for collaboration for heat island and heat action plan for the mobile road campaign in Delhi to map and assess Urban Heat Island Effect.
- » AAI/ML Conclave-2026, Trident Academy of Technology, Bhubaneswar, 07 February 2026.
- » 6th WCSSP India Science Workshop, hosted by MoES at INCOIS, Hyderabad, 09–13 February 2026.
- » India AI Impact Summit 2026, Bharat Mandapam, New Delhi, 16-21 February 2026.
- » GPEX Multistakeholder Workshop, Kyoto, Japan, 05 March 2026.
- » Indian Arctic Program review meeting, NCPOR, Goa on 09 March 2026.
- » 12th Better Air Quality Conference (BAQ 2026), Bangkok, Thailand, 10-14 March 2026.
- » Scientific Steering Committee meeting of "Atmospheric Processes and their Role in Climate (APARC)", 19-March 2026 (online)
- » Expert Group (EG) meeting of Reserve Bank – Climate Risk Information System (RB-CRIS), at RBI, Sansad Marg, New Delhi on 24 March 2026.
- » ICC Chair and Co-Chair and Senior Scientists from IITM, Pune, Dr. Swapna P. and Dr. Amita Prabhu actively participated in the ‘National Conference on Safety of Women at Workplace, (SHe-Box)’ at Vigyan Bhawan today on 14 February 2026, organised by Ministry of Women and Child Development.

Visitors

- 45 student and faculty member from Balbhim Arts Science and Commerce College visited HACPL, Mahabaleshwar on 03 March 2026.

Dr. S.B. Khamkar and Dr. Anil Chinde from Balbhim Arts, Science, and Commerce College, Beed, along with 45 MSc and BSc students, visited HACPL Mahabaleshwar on 05 March 2026 to explore the instrumentation facilities.

2 Indian coast guard officers visited the Paleo, Dendro, and COSMOS labs on 06 March 2026.

38 people from Bhavtal visited IITM to interact with Monsoon Mission scientist on 11 March 2026



156 students from Kendriya Vidyalaya No.1, AFS, Pune visited HACPL, Pune on 12 March 2026.

Mr. Venus Solanki and Mr. Sanildr Raghul R, and 3 IAF MET officers, visited HACPL Mahabaleshwar on 12 March 2026 for training on instrumentation.



Mr. Vinod Kumr Gautam, Project Manager, M/s SGS Weather and Environmental Systems Pvt Ltd, visited IITM during 12-20 March 2026 to conduct the training on the Ceilometer with Depolarization measurement capability.

Dr. Taveen Singh Kapoor, Postdoctoral Research Associate, Center for Aerosol Science and Engineering, Department of Energy, Environmental and Chemical Engineering, Washington University in Saint Louis visited IITM and delivered Prof. R. Ananthkrishnan Colloquium on 13 March 2026.



106 students and faculty visited IITM from Jaihind Polytechnic Kuran, Junnar on 17 March 2026.

A group of 35 members from Bhavatal, an environment-focused organisation based in Pune, visited IITM on 18 March 2026. The delegation had an engaging and insightful interaction with Dr. Thara Prabhakaran, Senior Scientist at IITM, whose research focuses on cloud microphysics, boundary layer meteorology, and weather modification (CAIPEEX). She shared valuable insights into atmospheric science, climate research, and ongoing scientific initiatives at the Institute



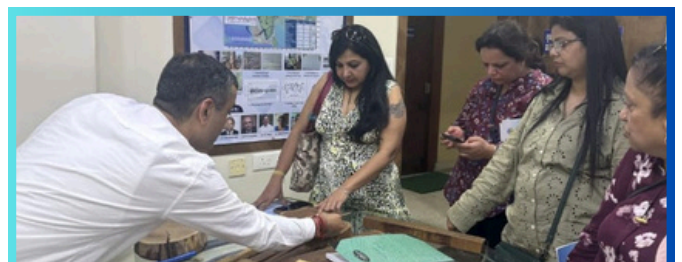
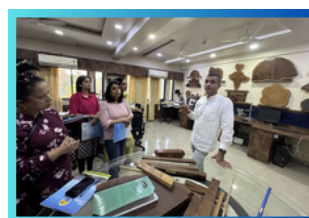
- 40 students and faculty visited IITM from Punyashlok Ahilyadevi Holkar Solapur University, Solapur on 23 March 2026.
- Dr. Ramashankar Vyas, Sr. Hindi Officer (Retd.), NCL, Pune visited IITM to deliver Rajbhasha Workshop on 25 March 2026.



- The Director of the International Center for Theoretical Physics (ICTP), Italy, Prof. Atish Dabholkar, visited the Indian Institute of Tropical Meteorology (IITM) on 18 February 2026. During the visit, he interacted with Dr.A.Suryachandra Rao, Director, IITM, and Program Heads and discussed potential future collaborations between ICTP and the Ministry of Earth Sciences (MoES).



- About 10 expert members of ANRF Prime Minister Early Career Research Grant (PM-ECRG) committee, visited IITM on 18 February afternoon. They visited the labs and interacted with scientists.
- As part of an initiative by the Press Information Bureau (PIB), a media tour to Pune (18–20 January 2026) was organized for women journalists from northern India. During their visit to the Indian Institute of Tropical Meteorology (IITM), they were briefed on key contributions in weather and climate research, forecasting capabilities, and services for disaster preparedness. Dr. A. Suryachandra Rao interacted with the participants, highlighting IITM’s mission and initiatives. The visit strengthened engagement between scientists and media, promoting informed and inclusive science communication.



Academic Cell Activities

- » IITM JRF Advertisement for Aug 2026 session has been published on IITM Website.
- » Advertisement for Ph.D. through AcSIR in August 2026 session has been published on IITM website.
- » Applications have been invited for Summer Internship for the Master's students with last date of application as 5th April 2026.
- » The Second Semester of IITM JRFs and AcSIR JRFs from Aug 2025-26 session has been started from 24 Marh 2026.

Ph.D. Proposal and Synopsis



Meenu Nair presented her Ph.D. synopsis proposal titled “Vertical Winds and Cloud Variability under Diverse Monsoon Convective Environment over Indian Region” on 06 January 2026 at Varahmihir Hall, under the guidance of Dr. Madhu Chandra R. Kalapureddy and co-guidance of Dr. Parthasarathi Mukhopadhyay.



Mercy Varghese presented her Ph.D. synopsis titled “Study of Cloud Base Aerosol Activation during Monsoon Using Observations and Numerical Modeling” on 10 March 2026 under the guidance of Dr. Thara Prabhakaran and co-guidance of Dr. Medha Deshpande.

Ph.D. Thesis Submissions



Amol Vibhute submitted the Ph.D. thesis titled “Interannual to Decadal Variations of the Asian Subtropical Westerly Jet and its Influence on Indian Summer Monsoon Rainfall” under the guidance of Dr. Chowdary Jasti S. and co-guidance of Dr. Anant B. Parekh and Dr. C. Gnanaseelan in February 2026 at Savitribai Phule Pune University, Pune.



Rakesh Ghosh submitted the Ph.D. thesis titled “Dynamical and Microphysical Impacts on the Lightning Characteristics of Clouds over a Tropical Region” under the guidance of Dr. Sunil D. Pawar and co-guidance of Dr. Anupam Hazra in February 2026 at Savitribai Phule Pune University, Pune.



Sophia Yacob submitted the Ph.D. thesis titled “Impacts of Meteorological Conditions on Climate Sensitive Diseases in India in a Changing Climate” under the guidance of Dr. Roxy Mathew Koll and co-guidance of Dr. Anandakumar Karipot in February 2026 at Savitribai Phule Pune University, Pune.



Tanmoy Goswami submitted his Ph.D. thesis titled “Understanding and Simulation of Extreme Rainfall Events Associated with Indian Summer Monsoon” under the guidance of Dr. Parthasarathi Mukhopadhyay in March 2026 at Savitribai Phule Pune University, Pune.

Ph.D. Award



Prashant Chavan was awarded a Ph.D. for the thesis titled “Variability of Aerosols in the Upper Troposphere and Stratosphere over the Asian Region and its Implication on the Troposphere” under the guidance of Dr. Suvarna Fadnavis in February 2026 at Savitribai Phule Pune University, Pune.



Snehlata Tirkey was awarded a Ph.D. for the thesis titled “A Stochastic Unified Approach to Cloud and Convection Parameterization in a General Circulation Model” under the guidance of Dr. Parthasarathi Mukhopadhyay and co-guidance of Dr. Ravuri Phani Murali Krishna in February 2026 at Savitribai Phule Pune University, Pune.

Honours and Awards

Dr. Thara Prabhakaran received the appreciation from Air Commodore (Meteorology), Air HQs Vayu Bhavan, New Delhi for the contribution and support extended by IITM by sharing the expertise to design, development and evaluation of Wind Profiler system being developed indigenously by Developing Agencies (DAs) under the Ministry of Defence's Make-II initiative, contribution to Atmanirbhar Bharat.

Dr. Suvarna Fadnavis is selected as an Expert Reviewer for IPCC-AR7 Report on short lived Climate forcers.



Dr. Roxy Mathew Koll (Scientist) is selected as a Scientific Advisor (Non-Resident Fellow) of the Council on Energy, Environment and Water (CEEW).

Dr. Sachin Deshpande chaired a session on "Quantitative precipitation estimation and Hydrological applications" in the 8th Conference on India Radar Meteorology (iRAD 2026), held at Gauhati University, Guwahati, from 07-09 January 2026. and **Dr. Subrata Kumar Das** chaired a session on "Microphysical studies and dual polarisation observations" in the 8th Conference on India Radar Meteorology (iRAD 2026), held at Gauhati University, Guwahati, from 07-09 January 2026



Dr. Atul Kumar Srivastava (Scientist) was invited as a Resource Person to interact with the students and Motivational Speech at Jawahar Navodaya Vidyalaya, Ghaziabad on 12 March 2026



Dr. Aditi Modi served as a Member of the International Scientific Planning Committee (ISPC) of the International Indian Ocean Science Conference (IIOSC-2025), held at Hyderabad, India, hosted by INCOIS, MoES, Government of India.

Dr. Sachin Patade has been appointed as an Editor of the journal Meteorology and Atmospheric Physics.

Prafull P. Yadav, Project Scientist, received first prize in the S.K. Ghosh Memorial, Young Scientist Award 2026 by the Indian Meteorological Society, Kolkata for Best Research Paper titled "Assimilation of high-resolution Ocean Color Monitor (OCM) aerosol optical depth in WRF-Chem improves PM forecasts over the Indian region" on 23 March 2026



Jagdish Jena (JRF) from the Atmospheric Research Testbeds (ART) project received the *Best Student Paper Award* at the *8th India Radar Meteorology Conference (iRAD-2026)*, organized by Gauhati University from January 6–9, 2026, for his study on convective features and precipitation efficiency using Mumbai's X-band Polarimetric Weather Radar Network.

Shruti Saini (SRF) from the Atmospheric Research Testbeds (ART) project was awarded the *Young Scientist Award* at the *8th iRAD-2026*, same conference for her work on interactions between radar-derived convective storms and convectively coupled waves over the southeast coast of India.



Md. Kaif, IITM-SRF at the Centre for Climate Change Research (CCCR), participated in the 3rd Indian Quaternary Congress (IQC-2026) held at the Indian Institute of Tropical Meteorology (IITM), Pune, during 21–23 January 2026, where he delivered an oral presentation under the theme "Methods, Modelling, and Applications" and was awarded First Prize and Best Oral Presentation among all presentations at the conference.

Aaritha V.V. received Best Student Paper Award for the paper: "Meta-Learning enhanced Gauge-Radar blending for High Resolution Urban Flood Simulations in Mumbai city" during the 8th iRAD 2026 held at Gauhati University, Guwahati, 07-09 January 2026.



International Engagement

Dr. Anguluri Suryachandra Rao, Director, was invited to participate in the WCRP GPEX Multistakeholder Workshop (05–06 March 2026, Kyoto) and to present research at the International Weather and Climate Modeling (IWCM) workshop at the Yokohama Institute for Earth Sciences, JAMSTEC on 06 March 2026, followed by a discussion meeting on 07 March 2026 under the JAMSTEC–MoES collaborative framework, during the period 05 March to 07 March 2026, at Kyoto & Yokohama, Japan.

Dr. Sachin D. Ghude, Scientist – F, was invited as a panellist expert for a session on regionally coordinated action on air and super pollutants through national strategies towards health, climate and water security in the Indo-Gangetic Plains and Himalayan Foothills (IGP-Hf) during the 12th Better Air Quality Conference (BAQ2026), during the period 10-14 March 2026, at Bangkok, Thailand.

Dr. Roxy Mathew Koll, Scientist – F, was invited to chair the IIOE-2 International Steering Committee Meeting and to participate in the Indian Ocean meetings (IOGOOS, IORP, IRF) as the IIOE-2 Science Theme Chair, during the period 16 March to 20 March 2026, at Busan, South Korea.



Dr. Ayantika Dey Choudhury was on deputation to attend the GPEX Multistakeholder Workshop held on 5–6 March 2026 in Kyoto, Japan.



Shri Vikram Satish Kadam, Project Scientist – III, was nominated to undergo on-site training and to take charge of instrument operation, maintenance and data management at the MCOH Maldives and to establish routine QA/QC, SOPs and local capacity for continued operation under the IITM-MMS programme, during the period 01 March to 15 June 2026, at Maldives.

Dr. Shikha Singh, Scientist – Eto attend the SCOR WG SubMHWs (SUBsurface Marine HeatWaves Working Group (SubMHW-WG) meeting, 25-02-2026 to 25-02-2026 at Glasgow, United Kingdom.

ANNOUNCEMENT

Workshop on Indian Ocean-Monsoon Climate: Annual to Decadal Variability, Mechanisms, and Predictability, at IITM, Pune, 19-22 May, 2026

हिंद महासागर-मानसून जलवायु पर कार्यशाला :
वार्षिक से दशकीय परिवर्तनशीलता, क्रियाविधियाँ और पूर्वानुमान क्षमता

Workshop on Indian Ocean-Monsoon Climate:
Annual to Decadal Variability, Mechanisms, and Predictability

19-22 मई 2026 19th - 22nd MAY 2026

CLIMATE VARIABILITY AND PREDICTION, IITM

19 मई, 2026
कार्यशाला पूर्व-प्रशिक्षण

20-22 मई, 2026
कार्यशाला

19th May, 2026
Pre-Workshop Training

20th - 22nd May, 2026
Workshop

Workshop on Indian Ocean-Monsoon Climate: Annual to Decadal Variability, Mechanisms, and Predictability, at IITM, Pune, 19-22 May, 2026

The workshop aims to improve understanding of annual to decadal climate variability and its impacts on the Indian Ocean and Indian summer monsoon. It will bring together experts in observations, theory, and modeling to examine key processes, predictability, and the strengths and limitations of current decadal prediction systems. Expected outcomes include improved scientific understanding, stronger collaborations, identification of research gaps, and recommendations for advancing annual to decadal climate prediction.

For More Details visit <https://iomc2026.tropmet.res.in>

10th International Conference on Fog, Fog Collection, and Dew, 22nd -26th Sept 2026



10th International Conference on Fog, Fog Collection, and Dew, 22nd -26th Sept 2026

The International Conference on Fog, Fog Collection, and Dew is a triennial global event organized by International Fog and Dew Association that brings together experts to discuss fog and dew processes, atmospheric water harvesting technologies, and sustainable water resource solutions, particularly for arid and semi-arid regions.

Read More: <https://fogdew26.tropmet.res.in/>

Weather and Climate Innovation Meet for Startups and Entrepreneurs (WISE-2026), 15 May 2026

Weather and Climate Innovation Meet for Startups and Entrepreneurs (WISE-2026), 15 May 2026

WISE-2026, organized by Indian Institute of Tropical Meteorology under the Ministry of Earth Sciences, brings together startups, entrepreneurs, scientists, investors, and mentors to foster innovation and collaboration in weather and climate science, with a focus on scalable solutions for climate resilience and sustainable development.

Read More: <https://wise2026.tropmet.res.in/>

Early Career Researcher (ECR) Event at APARC General Assembly 2026, 11 October 2026

As part of the APARC General Assembly 2026, the Early Career Researcher (ECR) event will provide students and early-career researchers an opportunity to interact with experts and explore applications of Artificial Intelligence, Machine Learning, and ESMValTool in Earth and climate science at Indian Institute of Tropical Meteorology. Participants can submit abstracts and expressions of interest through the conference website by 15 May 2026, and funding support is available for selected ECRs and students. For details, visit: <https://aparc2026.tropmet.res.in> and https://aparc2026.tropmet.res.in/sub_abs

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