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# Workshop on the Fundamentals of Air Quality Modelling and Its Role in Air Quality Management

Date: 1-2 April 2025

Location: Inspire Hall, Le Méridien New Delhi

## Agenda

Day 1 (1 April 2025)	
8:30–9:15 a.m.	<b>Registration</b>
9:15–9:30 a.m.	<b>Welcome Remarks and Scope of the Workshop</b> By Dr Piyush Bhardwaj, Research Scientist, Air Quality, CSTEP
9:30–10 a.m.	<b>Special Address</b> By Dr Arup Kumar Misra, Chairman, Assam Pollution Control Board (followed by Q&A)
<b>Session 1: Fundamentals of Air Quality Modelling, Reduced Complexity Air Quality Models, and Representation of Physical and Chemical Processes in Chemical Transport Models (CTMs)</b>	
10:00–11:00 a.m.	<b>Fundamentals of Air Quality Modelling</b> By Dr Piyush Bhardwaj, Research Scientist, Air Quality, CSTEP <i>Topics covered: Types of air quality models (box models, puff models, particle dispersion models, photochemical models) used for regulatory/research purposes and the typical inputs required to run air quality models</i>
11:00–11:15 a.m.	<b>Tea break</b>
11:15 a.m.–12:00 p.m.	<b>Reduced Complexity Models (RCMs) for Policy Use: Review of Commonly Used Models</b> By Prof Peter Adams, Carnegie Mellon University, Pittsburgh, PA, USA <i>Topics covered: Challenges with state-of-the-art CTMs, introduction to RCMs, and examples of commonly used RCMs (REACH, InMAP, EASIUR, and GAINS)</i>

12:00–1:15 p.m.	<p><b>Representation of Atmospheric Chemistry in Photochemical Models</b></p> <p>By Prof Shantanu Jathar, Colorado State University, Fort Collins, CO, USA</p> <p><i>Topics covered: How do photochemical models estimate pollutant concentration—continuity equation and its components, wet and dry deposition, and atmospheric chemistry</i></p>
<b>1:15–2:30 p.m.</b>	<b>Lunch and networking</b>

<b>Session 2: Representation of Physical Processes in CTMs, Emissions and Measurements, Model Validation and Performance, and Lagrangian Particle Dispersion Models</b>	
2:30–3:45 p.m.	<p><b>Representation of Physical Processes in Photochemical Models</b></p> <p>By Prof Peter Adams, Carnegie Mellon University, Pittsburgh, PA, USA</p> <p><i>Topics covered: How do photochemical models work, key components, dynamical core, and resolved and unresolved processes</i></p>
3:45–4:15 p.m.	<p><b>Utility of Satellite-Derived Measurements for Air Quality Monitoring</b></p> <p>By Prof Sagnik Dey, IIT-Delhi, India</p> <p><i>Topic covered: How can remote sensing measurements complement in-situ measurements</i></p>
4:15–5:00 p.m.	<p><b>Performance of Air Quality Models over India: Implications for Policymaking</b></p> <p>By Prof Srinidhi Balasubramanian, IIT-Bombay, India</p> <p><i>Topics covered: Importance of model validation and compilation of CTM performance over India for PM<sub>2.5</sub> and O<sub>3</sub></i></p>
<b>5:00–5:15 p.m.</b>	<b>Tea break</b>
5:15–6:00 p.m.	<p><b>Overview of Lagrangian Trajectory Models for Application in India</b></p> <p>By Prof Srinidhi Balasubramanian, IIT-Bombay, India</p>
6:00–6:45 p.m.	<p><b>Emissions and Measurements as an Integral Part of Air Quality Modelling</b></p> <p>By Prof Harish Phuleria, IIT-Bombay, India (pre-recorded)</p>

	<i>Topics covered: Emissions inventory development and efforts, how regional and city-level emission inventories differ, state of emission factor measurements in India</i>
6:45–7:30 p.m.	Discussion
<b>7:30–9:00 p.m.</b>	<b>Dinner and networking</b>

<b>Day 2 (2 April 2025)</b>	
9:30–9:45 a.m.	<b>Welcome Remarks</b> By Dr R Subramanian, Sector Head – Air Quality, CSTEP
9:45–10:15 a.m.	<b>Keynote Address</b> By Dr Prashant Gargava, Former Director, National Clean Air Programme (NCAP)
10:15–10:45 a.m.	<b>Special Address</b> By Dr S D Attri, Member (Technical), CAQM
10:45–11:00 a.m.	<i>Q&amp;A for Dr Prashant Gargava and Dr S D Attri</i>
<b>11:00–11:15 a.m.</b>	<b>Tea break</b>

<b>Session 1: Panel Discussions</b>	
11:15 a.m.–12:15 p.m.	<b>Panel Discussion on ‘Reflections on NCAP: Key Takeaways and Use of Air Quality Modelling for NCAP 2.0’</b> <b>Panellists:</b> Dr Virinder Sharma (Member – Technical, CAQM), Er Krunesh Garg (Chief Environmental Engineer and former Member Secretary, PPCB), and Dr KS Jayachandran (Member Secretary, DPCC) <b>(all TBC)</b> <b>Moderator:</b> Ms Swagata Dey, Policy Specialist, Air Quality, CSTEP
12:15–1:15 p.m.	<b>Panel Discussion on ‘Role of Air Quality Models for Air Quality Management: Key Learnings’</b> <b>Moderator:</b> Dr Piyush Bhardwaj, Research Scientist, Air Quality, CSTEP <b>Panellists:</b> Prof Shantanu Jathar (Colorado State University, Fort Collins, CO, USA), Prof Peter Adams (Carnegie Mellon University, Pittsburgh, PA, USA), Prof Srinidhi Balasubramanian (IIT-Bombay, India), Dr Sachin Ghude (IITM, Pune, India), and Prof Sagnik Dey (IIT-Delhi, India)
<b>1:15–2:15 p.m.</b>	<b>Lunch break and networking</b>

<b>Session 2: Research Presentations: Use of Modelling for Air Quality Management and Impact Assessment</b>	
2:15–2:45 p.m.	<b>Role of Air Quality Models in Air Quality Management: Examples from Western Countries</b>

	By Prof Peter Adams, Carnegie Mellon University, Pittsburgh, PA, USA
2:45–3:15 p.m.	<b>Impact Assessment Using Air Quality Models: Human Health</b> By Prof Sagnik Dey, IIT-Delhi, India
3:15–3:45 p.m.	<b>IITM-Decision Support System</b> By Dr Sachin Ghude, IITM, Pune, India
<b>3:45–4:00 p.m.</b>	<b>Tea break</b>

### Session 3: Research Presentations

4:00–4:20 p.m.	<b>PAVITRA: A Novel Reduced Complexity Modelling Platform for India</b> By Prof Chandra Venkataraman, IIT-Bombay, India
4:20–4:40 p.m.	<b>Making a Case for a Multi-Scale, Multi-Sector Mitigation Approach for Clean Air Goals in India</b> By Prof Srinidhi Balasubramanian, IIT-Bombay, India
4:40–5:25 p.m.	<b>‘To Tackle India’s Air Pollution, We Must Focus on Informal Sources’</b> By Lucas Rojas Mendoza, UC Berkeley <b>‘An Airshed Approach to Mitigating Extreme PM<sub>2.5</sub> Levels in India’s Indo-Gangetic Plains’</b> By Dr Neeldip Barman, IIT-Bombay, India <b>‘Strategising NCAP to Transition Beyond City Scales’</b> Dr Zainab Arub, IIT-Bombay, India
5:25–5:55 p.m.	<b>‘Interstate Transport of Fine Particulate Matter over Southern India: Implications for Regional Air Quality Management’</b> By Dr Nirav L Lekinwala, Senior Associate, Air Quality, CSTEP <b>‘REACH-India: A Location Agnostic Reduced Complexity Model for Policy Recommendations’</b> By Ms Sanjukta Ghosh, Senior Analyst, Air Quality, CSTEP
5:55–6:15 p.m.	<b>Concluding Remarks and Way Forward</b>

6:15–7:30 p.m.	<b>Networking or Optional Side Meeting:</b> <i>Building on existing data for policy use in India: Measurements, emissions, and modelling</i>
<b>7:30–9:00 p.m.</b>	<b>Dinner</b>