



Ministry of Earth Sciences
Government of India

AI/ML & Physical Models: Redefining Weather and Energy Forecasts

Day - 1

Thursday, 5th June, 2025

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|---------------------|---|---|
| 9:30 AM - 9:45 AM | ● | Opening Remarks and Agenda Setting by Dr. P Mukhopadhyay |
| 9:45 AM - 10:00 AM | ● | Welcome Address by Dr. Rajeevan |
| 10:00 AM - 11:30 AM | ● | Tutorial Introduction to Machine Learning by Dr. Praphul Chandra |
| 11:30 AM - 11:45 AM | ● | Coffee Break |
| 11:45 AM - 01:15 PM | ● | Tutorial Understanding Deep Learning - Concepts & Variants by Dr. Praphul Chandra |
| 01:15 PM - 02:00 PM | ● | Lunch |
| 02:00 PM - 03:30 PM | ● | Tutorial Hands-On Deep Learning by Mr. Dinker Mattam |
| 03:30 PM - 03:45 PM | ● | Coffee Break |
| 03:45 PM - 05:15 PM | ● | Tutorial Graph Neural Networks and Their Applications in Weather Forecasting by Mr. Bharathan RS |
| 05:15 PM - 05:30 PM | ● | Closing Remarks |

Day - 2

Friday, 6th June, 2025



- 10:00 AM - 11:30 AM ● **Tutorial | Diffusion Models and their applications in weather forecasting** by Dr. Prashantha + Dr. Manmeet, Dr. Naveen
- 11:30 AM - 11:45 AM ● *Coffee Break*
- 11:45 AM - 01:15 PM ● **Tutorial | ML/DL and weather and climate forecasting** by Dr. Siddharth Kumar and Dr. Bipin Kumar
- 01:15 PM - 02:00 PM ● *Lunch*
- 02:00 PM - 03:00 PM ● **Inauguration of workshop and release of book on Monsoon**
- 03:00 PM - 03:30 PM ● **Using machine learning to improve rainfall forecasts in East Africa** by Dr. Bobby Antonio, University of Oxford, UK
- 03:30 PM - 03:45 PM ● *Coffee Break*
- 03:45 PM - 04:15 PM ● **Machine learning-based climate prediction of rainfall extremes** by Dr. Peter Watson School of Geographical Sciences, University of Bristol, UK
- 04:15 PM - 04:45 PM ● **Combining AI with physics-based models** by Prof. Tim Palmer Oxford University, UK
- 04:45 PM - 05:15 PM ● **AIFS: ECMWF's machine learning forecasting system** by Dr. Matthew Chantry, ECMWF
- 05:15 PM - 05:45 PM ● **Predicting Weather Extremes in a Changing Climate** by Prof. Kerry Emanuel, MIT USA
- 05:45 PM - 06:15 PM ● **Stochastic Modeling of Precipitation Using Precipitation Area** by Prof. Sara Shamekh, New York University

Day - 3



Saturday, 7th June, 2025

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| 09:30 AM - 10:00 AM | ● | Kilometer-scale modelling of extreme precipitation using a regionally refined cloud resolving E3SM by Dr. Sourav Taraphdar, PNNL, USA |
| 10:00 AM - 10:30 AM | ● | Harnessing AI & Computing to Advance Climate Modeling and Prediction by Prof. Tapio Schneider, Caltech, USA |
| 10:30 AM - 11:00 AM | ● | Quantum Computing for Stochastic Cloud Representation by Mr. Kazumasa Ueno, Tokyo Univ, Japan |
| 11:00 AM - 11:30 AM | ● | Gap areas in prediction of extreme events by Dr. M Rajeevan |
| 11:30 AM - 11:45 AM | ● | Coffee Break |
| 11:45 AM - 12:15 PM | ● | AI for weather predictions: current status and future directions by Dr. J. Venkata Ratnam, JAMSTEC |
| 12:15 PM - 12:45 PM | ● | Winds of change: AI is a game changer in S2S forecasting of wind resources by Dr. Somnath Baidya Roy IIT, Delhi |
| 12:45 PM - 01:15 PM | ● | Wind forecasting-impact of aggregation by Dr. Anasuya Gangopadhyay, CSTEP, Bengaluru |
| 01:15 PM - 01:45 PM | ● | Lunch |
| 01:45 PM - 02:05 PM | ● | Indian km-scale model (IITM HGFM) and the future pathways of NWP by Dr. P. Mukhopadhyay IISER, Berhampur |
| 02:05 PM - 02:35 PM | ● | Deep Generative Models as surrogates for climate models for simulation of global SST by Dr. Adway Mitra, IIT, Kharagpur |
| 02:35 PM - 03:05 PM | ● | Neural Models for Forecasting Monsoon Onset over Kerala by Dr. Deepak Subramani, IISc, Bengaluru |
| 03:05 PM - 03:35 PM | ● | Accelerated Computing and Weather/Climate Forecast by Dr. Manish Modani, NVIDIA, India |
| 03:35 PM - 03:45 PM | ● | Coffee Break |
| 03:45 PM - 04:15 PM | ● | Wildfire smoke forecasting over S. America: past and future by Dr. Saulo Frietas, INPE, Brazil |
| 04:15 PM - 04:45 PM | ● | Solar and Wind energy generation forecasting by Dr. Pramod Jain Innovative Wind Energy, USA |
| 04:45 PM - 05:15 PM | ● | AI/ML approaches for improved forecasts over cities by Prof. Dev Niyogi, University of Texas, Austin |
| 05:15 PM - 05:30 PM | ● | Closing Remarks |