

Extreme Weather Events over India: Observations, Assimilation and Modeling with special focus on Tropical Cyclones (18-25 June 2018)

Overview

The Indian seas- Bay of Bengal (BoB) and the Arabian Sea (AS) – are impacted by 5-6 tropical cyclones (TC) each year. However, the Indian sub-continent accounts for the highest number of cyclone related fatalities globally. The Indian region is unique in nature in comparison to any other basin in the world as far as the genesis/period of occurrence of cyclones and death tolls due to such systems are concerned. Therefore, accurate prediction of time and place of occurrence and intensity of the extreme weather events (EWEs) are vital to minimize the loss.

This course is focused in three modules that should be taken together. The themes in Module A will introduce the participants to the entire gamut of the fundamentals of EWEs and a special emphasis on land falling Tropical Cyclones along with the scientific basis and observational aspects and to develop some basic understanding on EWEs. In Module B, the theory on meso-scale modelling systems with special focus on HWRF modeling system will be emphasized. Module 3 comes with extensive group discussion with hand on session in analyzing meso-scale model products of TC with advanced diagnostics.

This course will help in providing a scientific platform on understanding extreme weather events with special focus on tropical cyclones and associated coastal hazards. Advanced data assimilation techniques to use INSAT-3D/ 3DR satellite data, Doppler weather radar data, will be introduced. The atmospheric component of the modeling system coupled to land and ocean will be discussed. Recent advanced diagnostic visualization tools and graphics will be practiced with the end products of the model to have clear idea in understanding the structure and evolution of TCs. This will provide an excellent platform for students, research scientists and enhance the capacity building of the academic institutions, NGOs, Govt. administrative authority etc. Thus the proposed course will provide an integrated end-to-end system involving observation, modeling, impact / risk assessment, mitigation and adaptation.

Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

Modules	A: Introduction to EWE : June 18 – June 19 B: Meso-Scale Modelling systems : June 20 - June 22 C: Tutorial and hands on session : June 23 – June 25 Number of participants for the course will be limited to fifty.
You Should Attend If...	<ul style="list-style-type: none"> ▪ You are a student at all levels (B.Tech./M.Sc./M.Tech./PhD) from academic institutions. ▪ You are a research scholar, scientists from academic, operational and research institutes within India. ▪ You are a NGOs, Govt. administrative authority, policy makers and smart city managers.
Fees	<p>The participation fees for taking the course is as follows:</p> <p>Participants from abroad : US \$500 Industry/ Research/Operational Organizations: Rs. 15000/- Academic Institutions: Rs. 5000/- In-house participants: A nominal fee of Rs. 1000/-</p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr. free internet facility. The participants will be provided with accommodation on payment basis. A few participants from Academic Institutions will be provided partly/ fully travel allowance by 3AC at shortest route/ local hospitality (board and lodging) upon the request with justification to the course coordinator.</p>

The Faculty



Dr. S. G. Gopalakrishnan is a research meteorologist in the US National Oceanic and Atmospheric Administration's (NOAA) Hurricane Research Division (HRD) and principal architect of the Hurricane Weather Research and Forecasting (HWRF) model. His

research interests include simulating complex, non-linear, scale-interacting systems from dry thermals to hurricanes and examining their development-related mesoscale structures, evolution, and mechanisms; testing theories, hypotheses and various near-surface model physical representations; and interpreting such systems' modeled and observed behavior. He has a Ph.D. in atmospheric science from the Indian Institute of Technology Delhi, India.



Prof. U. C. Mohanty, Professor, after about 34 years of experience in teaching and research in Indian Institute of Technology (IIT) Delhi, India is currently serving as a Visiting Professor in the School of Earth, Ocean and Climate Sciences, IIT Bhubaneswar. Prof.

Mohanty received his Doctoral Degree in Tropical Meteorology from Odessa Hydro-Meteorological Institute, USSR in 1978. His research areas of interest are Tropical Meteorology, Monsoon Dynamics, Climate studies and Meso-scale Modelling of Extreme Weather Events such as Tropical Cyclones. Prof. Mohanty has guided 38 PhD students and has more than 270 publications in peer reviewed national and international journals. Prof. Mohanty has received several awards and honors for his significant research contribution in atmospheric sciences.



Dr. Sandeep Pattnaik is the Assistant Professor in the School of Earth Ocean and Climate Sciences (SEOCs), IIT Bhubaneswar. He has worked as Scientist at Indian Institute of Tropical Meteorology (IITM), Pune. His research interest includes tropical cyclone,

monsoon and extreme weather events. His research work has been published in many national and international peer reviewed journals.

Additional Resource Persons:

Dr. V. S. Prasad,
Scientist-G,
National Center for Medium Range Weather Forecast, MoES

Dr. Krishna K Osuri,
Assistant Professor,
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Course Coordinator

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