



Open Class Room Online Lecture Series in Atmospheric and Climate Sciences (weekly)



South Asian Meteorological Association (SAMA) & SRM Institute of Science and Technology (SRM IST)

Global warming and climate Change are the global concerns nowadays due to its multi-dimensional impacts. Special importance is given by the governments to tackle the impacts of global warming and climate change such as floods, droughts over south Asia. Human resources for carrying out the research in the areas of climate science and change are very limited in south Asia. Also, a basic understanding of weather systems and the laws governing the Earth's atmosphere is very essential to keep the vigor of climate science and other associated areas at forefront. A preliminary knowledge in meteorological observations, weather forecasting, weather monitoring through satellites, meteorological advisories to the student community help them in developing the holistic approaches to tackle the weather and climate disasters. Hence it is imperative to impart the meteorology education to the student community of the south Asian countries. In view of this, SAMA and SRM IST proposed to organize webinars on the fundamental popular topics of Climate and Atmospheric sciences.

Under this program, **four lectures in every month will be organized online** by selecting the topics from standard text books. The talk will have 50 minutes duration (strictly) followed by 15 minutes interaction. Eminent academic faculty will be delivering these lectures. **The target audience of these lectures are the students pursuing the Masters in Meteorology, Atmospheric Science, research scholars of earth and climate sciences and early career scientists.** To start with, we will be organizing the four modules of Atmospheric Physics and will continue with Atmospheric Dynamics and Atmospheric Measurements.

Speakers of the 1st Module (Orientation and regular topics of Atmospheric Physics)



Prof. U.C. Mohanty
IIT Bhubaneswar



Dr. M. Mohapatra
DGM, IMD



Prof. S.K. Dash
IIT Delhi



Dr. M. V. Ratnam
NARL, Gadanki



Prof. D.V. Bhaskar Rao
AU, Visakhapatnam



Dr. B. Mukhopadhyay
IMD, Pune



Prof. P. Pradeep Kumar
SPPU, Pune

Certificate will be issued on successful completion and evaluation of participation in each module

Lecture Schedule

	Weeks	Lecture No	Topic	Tentative subtopics to be covered	Tentative speaker	Schedule
Orientation programme in Atmospheric and Climate Sciences						
	Week 1	1	Overview of weather and climate	Weather and climate concept, weather patterns, monsoons.,extreme events, climate change etc.,	Prof. U.C. Mohanty, IIT B	7 - 01 - 2023, 3.00pm to 4.15pm
	Week 2	2	Weather and climate services	Met advisories, weather forecast, hazard alerts etc.,	Dr. M. Mohapatra, DGM, IMD	14 - 01 - 2023, 3.00pm to 4.15pm
	Week 3	3	Research and opportunities	Avenues of higher education, research and employment opportunities	Prof. S.K. Dash, IIT D	21 - 01 - 2023, 3.00pm to 4.15pm
	Week 4	4	Emerging technologies in atmospheric observations	Probing the atmosphere (ex : drones) any other measurement techniques	Dr. M.V. Ratnam, NARL	28 - 01 - 2023, 3.00pm to 4.15pm
Module : Atmospheric Physics						
Submodule 1 : Atmospheric Thermodynamics						
	Week 5	1	Structure of the atmosphere and vertical distribution of temperature	Composition, vertical structure, Lapse rate, dry adiabatic, moist adiabatic, potential temperature, virtual temperature	Prof. D.V. Bhaskar Rao, Andhra University	04 - 02 - 2023, 3.00pm to 4.15pm
	Week 6	2	Pressure distribution	Partial pressure, Hydrostatic equilibrium, Pressure - Altitude relationship	Prof. D.V. Bhaskar Rao, Andhra University	11 - 02 - 2023, 3.00pm to 4.15pm
	Week 7	3	Atmospheric stability	Stable, unstable, neutral and convectively unstable, LCL, LFC	Prof. D.V. Bhaskar Rao, Andhra University	18 - 02 - 2023, 3.00pm to 4.15pm
	Week 8	4	Thermodynamic Diagrams	Energy equivalence, properties and graphical computation	Prof. D.V. Bhaskar Rao, Andhra University	25 - 02 - 2023, 3.00pm to 4.15pm
Submodule 2 : Atmospheric Radiation						
	Week 9	1	Laws of radiation and radiation budget	Black body radiation law, Planks law, Solar constant, shortwave and outgoing longwave radiation, energy budget	Dr.B. Mukhopadhyay, IMD, Pune	04 - 03 - 2023, 3.00pm to 4.15pm
	Week 10	2	Greenhouse effect	Radiative equilibrium, climate change framework	Dr.B. Mukhopadhyay, IMD, Pune	11 - 03 - 2023, 3.00pm to 4.15pm
	Week 11	3	Scattering concepts	Size parameter, concept of Rayleigh and Lorentz - Mie scattering	Dr.B. Mukhopadhyay, IMD, Pune	18 - 03 - 2023, 3.00pm to 4.15pm
	Week 12	4	Radiative transfer	General equation, plane parallel atmosphere and solar heating rates	Dr.B. Mukhopadhyay, IMD, Pune	25 - 03 - 2023, 3.00pm to 4.15pm
Submodule 3 : Clouds						
	Week 13	1	Processes of cloud formation	Formation and Types of Clouds, Homogeneous and Heterogeneous Nucleation Process	Prof.P. Pradeep Kumar, SPPU	01 - 04 - 2023, 3.00pm to 4.15pm
	Week 14	2	Cloud microphysical processes; Precipitation mechanism in warm clouds	Droplet growth by Condensation and Collision-Coalescence mechanisms, Measurement of Cloud Parameters like CCN, LWC, Cloud droplet spectrum etc.	Prof.P. Pradeep Kumar, SPPU	08 - 04 - 2023, 3.00pm to 4.15pm
	Week 15	3	Precipitation mechanisms in cold clouds	Ice Nucleation Pathways, Ice Nuclei, Growth of Ice, Ice Multiplication processes.	Prof.P. Pradeep Kumar, SPPU	15 - 04 - 2023, 3.00pm to 4.15pm
	Week 16	4	Atmospheric Electricity	Cloud Electrification mechanisms and Lightning	Prof.P. Pradeep Kumar, SPPU	22 - 04 - 2023, 3.00pm to 4.15pm

About SAMA :

South Asian Meteorological Association (SAMA) was established on 3rd August 2020 as a professional non-profit society for the promotion of Meteorological and allied sciences and their application for the safety, well-being and sustainable development of the citizens of the nine South Asian countries. Presently, SAMA has more than 380 members including life and student members. SAMA has three institutional members; ICIMOD, Nepal; RIMES, Bangkok and NAM S & T Center as of now, which will increase with time. During its journey in the last 2 years SAMA has conducted many webinars, workshops, quiz competitions for the school children, special day celebrations in association with India Meteorological Department (IMD), Vigyan Prasar, Govt of India, SRM IST etc., The President and Secretary of SAMA are AVM (Prof) Ajit Tyagi, Former Director General of Meteorology, IMD and Prof. Someshwar Das, Former Professor, Central University of Rajasthan. SAMA has different scientific and outreach committees such as NWP, Satellite Meteorology, Air Pollution, Climate Change, Education & Outreach etc.,

About SRM IST:

SRM Institute of Science and Technology is one of the top ranking universities in India with over 52,000 full time students and more than 3200 faculty across all the campuses – Kattankulathur, Ramapuram, Vadapalani Campus – all in and around Chennai, Tiruchirappalli (in TN), Modinagar (in UP) & Sonapat (in Haryana) – both of which are located near Delhi NCR, Amaravati (in AP), Gangtok (in Sikkim) – offering a wide range of undergraduate, postgraduate and doctoral programs in six Faculties – Engineering & Technology, Management, Medicine & Health sciences, Science & Humanities, Law and Agricultural Sciences.

SRM IST has High Performance Computing Cluster with the star server of 7.654 TFs with 300GB 7.2K RPM SATA 2.5” Hard Drive

Department of Physics, SRM IST offers Ph.D in Atmospheric Science and M.Sc Atmospheric Science (4 semester) programs with the qualified faculty and state-of-the-art lab. SRM has the Mini Micro Pulse LIDAR facility that is sponsored by Ministry of Earth Sciences and other various atmospheric instruments.

Register here for the lecture series:

<https://forms.gle/unwgcALSXLZar5A7>

to receive the online meeting details

Advisory Panel	Organizing Panel
Prof. U.C. Mohanty (IIT, Bhubaneswar)	Dr.T.V. Lakshmi Kumar, SRMIST, Chennai, ECT - SAMA
Prof. Towhida Rashid (University of Dhaka, Bangladesh)	Dr. Rohini Bhawar, SPPU, Pune, ECT – SAMA
Prof. D.V. Bhaskar Rao (Andhra University, Visakhapatnam)	Dr. Madan Sigdel, TU, Khathmandu, ECT – SAMA
Prof. Deepak Aryal (Tribhuvan University, Kathmandu, Nepal)	Dr. Fatima Akther, DU, Dhaka, ECT - SAMA
Prof. Pradeep Kumar (SPPU, Pune)	For more details, contact : sama03aug@gmail.com
Prof. S.B. Roy (IIT-Delhi)	
Dr. S.N. Dutta (IMD, Pune)	
Dr. M. V. Ratnam (NARL/ ISRO, Tirupati)	

Prof. Someshwar Das
Secretary, SAMA

AVM (Prof) Ajit Tyagi
President, SAMA