IITM's 'Prof. R. Ananthakrishnan' Colloquium

Late Prof. R. Ananthakrishnan (Ex-Director and Honorary Fellow of IITM, Pune started his research carrier as a research scholar in the field of light scattering under the guidance of noble laureate Prof. C.V. Raman and was awarded D.Sc. in 1937 from University of Madras. Then he joined IMD and occupied several positions up to DDG and then he worked as Director IITM during 1968-1971. He was awarded Padmashree by President of India in 1969 and C.V. Raman Centenary Medal in 1988. He was elected as an INSA Fellow in 1961 and was also member of many learned and professional societies like (Indian Academy of Sciences, Maharashtra Academy of Sciences). He was associated with many technical committees and working groups of WMO Geneva. He was editor of reputed national and international journals in Meteorology.

Prof. Ananthakrishnan was deeply associated in organizing and teaching Msc./M.Tech. Courses in Meteorology at University of Cochin and University of Pune. Under his able guidance 12 persons were awarded Ph.D.

Research contribution of Prof. R. Ananthakrishnan covers a wide range of topics viz. Light scattering and Raman Effect, Solar Physics and Meteor Astronomy and Meteorology. In the field Meteorology his work covers: Aerology, Dynamics, Thermodynamics, monsoon circulation, Tracks of storms and depressions. Atmospheric pressure and oscillations, Indian rainfall and features associated with onset of southwest monsoon and identification of errors in upper air data. To meet defense needs he organized the publications entitled 'Climatology of Himalayas, Tibet and adjoining areas. There are 110 national/international (research papers/ technical contributions) papers to his credit and a book entitled 'An Introduction to Meteorology'. This textbook is found to be extremely useful to all the new comers in the field of meteorology. Prof. R. Ananthakrishnan pursued his research and guided researchers in atmospheric science even after his retirement as an honorary fellow of IITM till his last days.

Dr. Vinu Valsala

Title of the Talk: **"The IOD Impacts on the Indian Ocean Carbon Cycle"**

Abstract: The study examines the impacts of Indian Ocean Dipole Mode (IOD) on the upper ocean carbon cycle and its variability in the Indian Ocean with available biogeochemical observations and 60 years (1960-2019) of model outputs from a global ocean biogeochemical general circulation model. The upper ocean carbon cycle variability of the Indian Ocean is faithfully reproduced by the model when compared with available observations. The IOD leads to a substantial sea-to-air CO_2 flux variability in the southeastern tropical Indian Ocean over a broad region (70°E-105°E, 0-20°S), with more focus near the coast of Java-Sumatra due to the prevailing upwelling dynamics and associated westward propagating anomalies. The sea-to-air CO_2 fluxes, surface ocean partial pressure of CO_2 (pCO_2), the concentration of dissolved inorganic carbon (DIC), and ocean alkalinity (ALK) range as much as ±1.0 mole m^{-2} yr^{-1}, ±20 µatm, ± 35 µmole kg^{-1}, and ± 22 µmole kg^{-1} within 80°E-105°E, 0-10°S due to IOD. The DIC and ALK are significant drivers of pCO_2 variability associated with IOD. The roles of temperature (T) and biology are found negligible. A relatively warm T and extremely high freshwater forcing make the southeastern tropical Indian Ocean carbon cycle variability submissive to DIC and ALK evolutions in contrast to the tropical eastern Pacific where changes in DIC and T dominate the pCO_2 interannual variability. For the first time, this study provides a most comprehensive and extended analysis for the region while highlighting significant differences in carbon cycle variability of the eastern tropical Indian Ocean compared to that of the other parts of the global oceans.

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