07 APRIL 2022

Thursday, 11:00 IST

(05:30 UTC)

#AzadiKaAmritMahotsav

Lecture Series on

Cloud and Precipitation Physics and Dynamics

सत्यमेव जयते

Ministry Of Earth Sciences

Government of India

Precise Mathematical Pattern Underlying Cloud Formation in Chaotic Atmospheric Flows

Dr. A. Mary Selvam

Indian Institute of Tropical Meteorology, Pune

About the speaker:

Dr. A. Mary Selvam worked in IMD during 1962-1966 and in IITM during 1966-1999. She has retired as Deputy Director, Physical Meteorology and Aerology Division at IITM. Her main area of work was cloud physics, cloud seeding, boundary layer meteorology and non-linear dynamics. She has been an outstanding researcher even after her retirement and has published three books. She has also published over three hundred research papers. She acknowledges several of her colleagues at IITM for excellent collaborations in research and contributions. Her talk is based on her paper (1) Deterministic chaos, Fractals and Quantumlike Mechanics in Atmospheric Flows A. Mary Selvam, 1990: Deterministic chaos, fractals and quantum-like mechanics in atmospheric flows. Canadian J. Physics 68, 831-841. http://xxx.lanl.gov/html/physics/0010046 and the book (2) Rain Formation in Warm Clouds: General Systems Theory, A. M. Selvam, Springer 2015

Abstract: General systems theory for atmospheric flows developed at IITM visualizes the hierarchical growth of larger-scale eddies from space-time integration of smaller-scale eddies resulting in an atmospheric eddy continuum manifested in the self-similar fractal fluctuations of meteorological parameters. The basic thermodynamical parameters such as pressure, temperature, etc., are given by the same classical statistical physical formulae (kinetic theory of gases) for each component eddy (volume) of the atmospheric eddy continuum. It may be shown that the Boltzmann distribution for molecular energies also represents the eddy energy distribution in the atmospheric eddy continuum. In the following, general systems theory model concepts for atmospheric flows are summarized with model predictions for atmospheric flows and cloud growth parameters. Model predictions are compared with observations.

https://youtu.be/QbUETxzR5iQ