

## **CLOUD PHYSICS AND MESOSCALE PHENOMENA**

- Introduction
- Surface tension and curvature effects
- Kelvin equation
- Classical Kohler theory
- Droplet growth kinetics
- Warm cloud microphysics
- Ice cloud microphysics
- Cloud parameterization schemes
- Special topics
- Storm Physics. Single and multi-cell storms.
- Speed and direction of severe storms. Structure and characteristics of the storm front.
- Basic thermodynamic and dynamic atmospheric parameters for storms' prediction.
- Mesoscale Convective Systems (MCS) – Definition – Conditions for development – Types and characteristics
- Structure of vertically developing clouds in terms of circulation patterns within the clouds and in the surrounding atmosphere. Development stages.
- Precipitation estimation in MCS.
- Multispectral satellite based indices for the recognition and tracking of MCSs.
- Extreme weather events – Definition, causes and frequency for development, relation to climate change.