From Rising Air to Basin-Wide Rainstorms

EIT Distinguished Environmental Lecture Series, 6th



Da Yang

Time

September 7, 2026 14:00-15:30 PM

Venue

202, Safewell Building

盛威楼 202

Speaker

Dr. Da Yang's research focuses on atmospheric and climate dynamics, with an emphasis on the fundamental mechanisms governing atmospheric convection and rainstorms across a wide range of temporal and spatial scales. He developed a multi-scale model explaining key features of the Madden-Julian Oscillation, established a boundary-layer framework to understand the spontaneous formation of convective aggregation, and identified the buoyancy effect of water vapor as a mechanism that can produce a cooler rising branch of the Hadley circulation relative to its surroundings. He also introduced the concept of vapor kinetic energy and derived its governing equation to diagnose the development of atmospheric rivers. More recently, he developed a linear model that accurately explains the response of ENSO to climate warming. Dr. Yang serves as an Associate Editor for the Journal of Climate and is a member of the World Climate Research Programme (WCRP) MJO Task Force.

Abstract

Atmospheric convection and clouds are among the largest sources of uncertainty in predicting future climate change and extreme weather events. Basic questions in the field include: What makes air rise to form clouds? How do individual convective clouds organize into large-scale rainfall patterns? How does convection respond to climate warming? In this talk, I will present our recent efforts toward answering these questions by integrating theory, observations, a hierarchy of numerical models, and machine learning methods.

Host

Chunmiao Zheng

Chair Professor and Vice President

AGU Fellow