

# LSGI Research Seminar

## Water Vapor, Clouds, and Convective Storms in the Atmosphere



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The Hong Kong University of Science and Technology

**Date:** 20 Dec 2021 (Mon)

**Time:** 10:30 - 11:30 a.m.

**Venue:** TU103 & Hybrid online @ zoom

**Language:** English

### Bio:

*Xiaoming SHI joined the Division of Environment and Sustainability at the Hong Kong University of Science and Technology (HKUST) in 2018 fall. He obtained his Ph.D. degree in atmospheric sciences from the University of Washington in 2015, after which he worked as a postdoctoral scholar in the Department of Civil and Environmental Engineering of the University of California, Berkeley. His research focuses on the simulation of cloud and turbulence and their implications to weather and climate predictions. His teaching interests at HKUST include sustainability, climate science, and climate policy.*

### Abstract:

*Water vapor in the atmosphere rarely exceeds 5% of surface air, and cloud droplets and ice are only 1/250 of total atmospheric water. However, the variability in water vapor and its condensed form, clouds, play vital roles in modulating weather and climate. In convective rainstorms, air-sea interaction and boundary layer turbulence determine the amount of moisture supplied to the bottom of storms. Slight variations in water vapor significantly alter the available potential energy for convection as air parcels rise in the atmosphere. Clouds cover 70% of the sky on average. Though being light in mass, their radiative effects are potent forcing to the atmosphere. Depending on the location and amount of cloud droplets and ice, convection in the atmosphere may organize as homogeneous random cells or in a clustered form where an intense large-scale system arises accompanied by dry air surrounding the system. In this discussion, I will demonstrate those powerful effects of water vapor and clouds with real cases and idealized numerical simulations. Detailed physical and dynamic processes will be explained and discussed.*

**All are welcome.**

**To register, please click [here](#) for the details.**

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