The University of Hong Kong
School of Biological Sciences

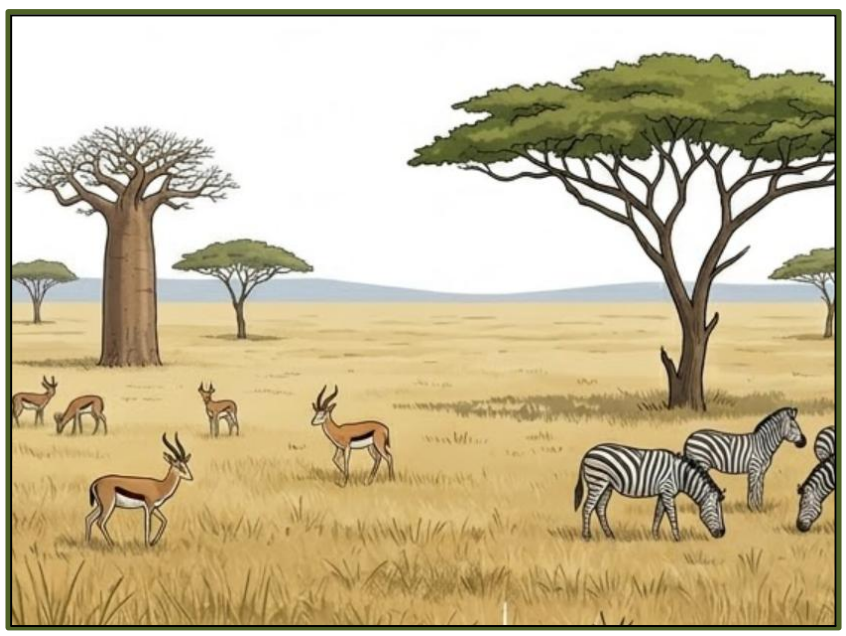
Qualifying Seminar

Understanding leaf emergence and its effects on ecosystem function in global dry tropics

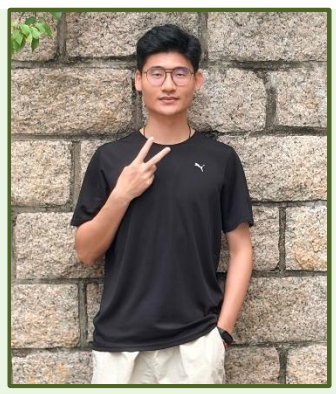
Date: 28th April 2026

Time: 11:00 am

Venue: 6N-11



About the speaker:



Xiang Zeng is a PhD student under the supervision of Prof. Jin Wu. His research focuses on leaf emergence phenology in the dry tropics and how they regulate seasonal to inter-annual ecosystem carbon budgets in the context of global change.

Abstract:

Dry tropical ecosystems drive nearly 40% of the interannual variability in global terrestrial carbon exchange, acting as powerful amplifiers of climate change. However, these systems, characterized by continuous warmth and intense seasonal droughts, are increasingly threatened by escalating moisture stress. Under such severe constraints, plants must actively regulate their phenological rhythms to survive. As the starting point of these cycles, leaf emergence serves as the critical switch initiating ecosystem carbon uptake. Yet, the abiotic and biotic drivers of leaf emergence, and how its shifts ultimately reshape the carbon balance, remain poorly understood. To bridge this gap, we integrate global satellite phenology, climate data, plant traits, and insect occurrence records to address three core objectives: (1) unravel the driving mechanisms of dry tropical leaf emergence and clarify its response to recent climate change; (2) quantify the seasonal tradeoffs between water and carbon triggered by shifts in leaf emergence, revealing how these dynamics ultimately impact regional carbon uptake; and (3) project how these critical tradeoffs and overall ecosystem sustainability will be rewritten under future climate scenarios with intensifying water limitation. These findings provide a vital mechanistic foundation for improving Earth System Models, assessing climate impacts, and informing adaptation strategies for the vulnerable dry tropics.