The University of Hong Kong
School of Biological Sciences

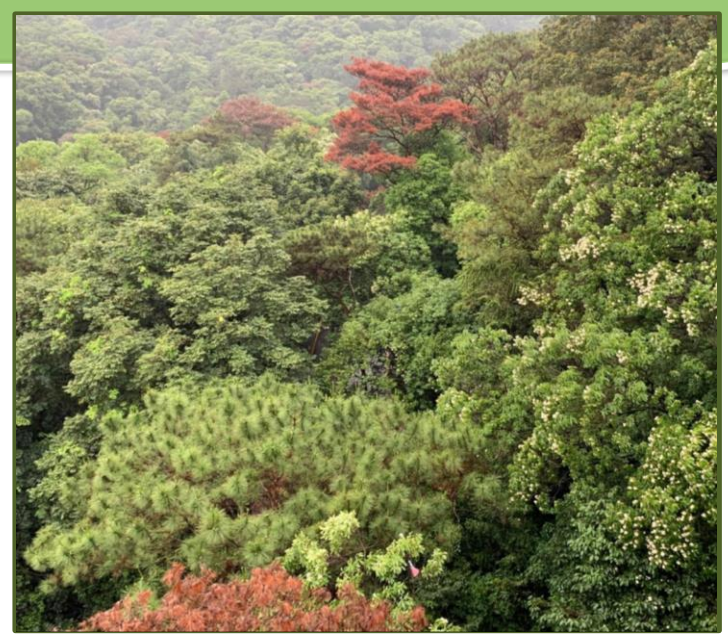
Qualifying Seminar

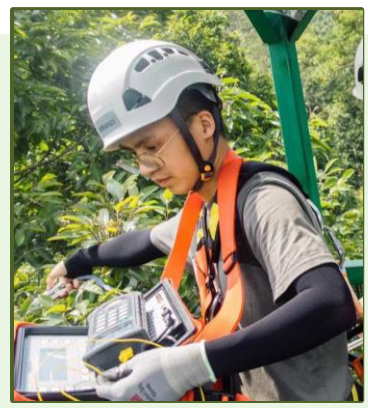
Exploring how biotic factors control plant thermoregulation strategies and its implication under climate change

Date: 02/07/2021 (Friday)

Time: 1500

Venue: 3N-01 + ZOOM





About the speaker:

Zhengfei Guo is a PhD student in Dr. Jin Wu's lab. He is interested in how biotic factors control plants response to the environment. To understand this, he is incorporating aspects of ecophysiology, process-based modelling, and remote sensing into his research.

Abstract:

Plant thermoregulation is the capacity of plants to regulate their tissue temperature to approach the optimal photosynthetic temperature (T_{opt}) for maximum carbon gain, thereby affecting plant growth and terrestrial carbon cycle. Currently, abiotic factors, such as climatic conditions, are regarded as the main drivers of plant thermoregulation, but considerable variability has also been observed at local regions with similar climatic conditions but different biotic factors (e.g. plant functional traits). This indicates both abiotic and biotic factors are important in shaping plant thermoregulation, but the specific pathway remain understudied, especially when both are likely to be heavily influenced by climate change. To clearly understanding the drivers of plant thermoregulation and its implication on plant growth under climate change, my proposal will address following two questions: **1) How do biotic factors control plant thermoregulation, from leaf to canopy scales? 2) How can biotic factors help predict forest response to climate change from site to global scales?** To address these questions, I will first develop a scalable trait-based model, where both biotic and abiotic factors can be parameterized, to explore the pathway biotic factors shape plant thermoregulation from leaf to canopy scales. After understanding the biotic controls at local scale, I will explore how plant thermoregulation affects plant growth on a global scale. Lastly, I plan to link future climate scenarios with ecosystem-specific plant thermoregulation strategies to estimate the impact of climate change on plant productivity.