



The University of Hong Kong
School of Biological Sciences

**Public
Seminar**

Decoding tropical deciduousness phenology: patterns, drivers and implications to regional carbon cycle

Date: 8 Aug 2024 (Thu)

Time: 0900

Venue: KSBS 6N-11 & Zoom



About the speaker:

Guangqin Song is a PhD candidate in Dr. Jin Wu's lab. His research focuses on monitoring global tropical phenology and understanding its drivers and impacts on key ecosystem processes in the tropics.



Abstract:

Tropical rainforests, known for their evergreen landscapes, importantly regulate large-scale carbon and water fluxes and regional climate. However, increasing fine-scale studies reveal massive “non-green” (deciduousness) phenological dynamics within tropical ecosystems, resulting from the coexistence of evergreen and deciduous trees. This cryptic phenology pattern of “landscape evergreen and strong fine-scale dynamics” highlights an urgent need for accurate characterizations of tropical deciduousness phenology across scales, from individual trees to ecosystems, but remains challenging. To resolve the knowledge gaps, this research first integrates deep learning methods with phenocam observations to enhance the characterization of tropical deciduousness monitoring at crown scale. Subsequently, this research developed an unsupervised deep learning method and evaluated the impact of spatial scale on tropical deciduousness monitoring to identify cost-effective methods for extensive monitoring across tropics. Lastly, this research extends the developed method to the regional scale to explore the geographical variation of tropical deciduousness pattern at regional scale and investigates its drivers and implications for the large-scale carbon cycle. Collectively, this research provides a bottom-up approach to quantify the deciduousness phenology across tropical regions and provides a new paradigm in tropical forest research to incorporate deciduousness phenology, enabling more accurate assessments of tropical forests' response to climate change.