The University of Hong Kong
School of Biological Sciences

Public Seminar

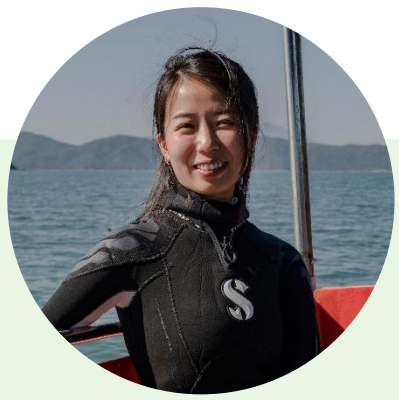
Multiscale Ecological Assessment to Support Resilience-Based Coral Restoration and Adaptive Reef Management in Hong Kong

Date: 23 Jan 2026

Time: 1pm

Venue: 6N11, KBSB

About the speaker:



Vriko Yu is a PhD candidate supervised by Prof. Moriaki Yasuhara and Prof. Shelby McIlroy. She applies evidence-based restoration approach and serves on on HKSAR government committees, including the Green Technology & Finance Development Committee, the Country and Marine Parks Board, and the Environmental Impact Assessment Appeal Board.

Abstract:

Coral reefs are degrading under ocean warming, intensifying marine heatwaves, and chronic local stressors such as turbidity, eutrophication, and habitat modification. In marginal, urbanised reef systems these pressures can outpace natural recovery, so passive protection alone may be insufficient to maintain reef-associated functions. Yet subtropical reefs in East and Southeast Asia remain underrepresented in restoration science, despite their relevance to densely populated coastlines. Using Hong Kong as a case study, this thesis asks how resilience-based coral restoration can be operationalised in a subtropical, urban context by linking evidence from sourcing, fragment performance, and ecosystem response. I frame restoration as a coupled decision problem - what to source, what to outplant, when to outplant, and how to evaluate outcomes - and address it using a multiscale framework integrating population genomics, controlled thermal-stress physiology, and multi-year field monitoring on engineered substrates. RADseq analyses of the urban-tolerant coral *Oulastrea crispata* detected no population structure across Hong Kong's west-east water-quality gradient; sampling analyses suggest ~13 individuals from any sampled site capture ~80% of observed allelic richness, implying flexible sourcing may be feasible for this taxon. Because genetic homogeneity does not imply thermal resilience, experiments on *Acropora* cf. *samoensis* show a temperature-by-fragment-size interaction, where larger fragments generally maintain greater physiological stability under intermediate thermal conditions. Finally, four years of monitoring of 3D-printed Reef Tiles™ in Hoi Ha Wan Marine Park show 88% survivorship across 378 outplanted fragments (losses mainly from detachment) and clear habitat uplift (~7x higher fish abundance; ~60% higher macroinvertebrate abundance vs adjacent sand). Overall, the thesis provides an integrated assessment logic to guide adaptive restoration design and monitoring in Hong Kong.