



The University of Hong Kong  
School of Biological Sciences

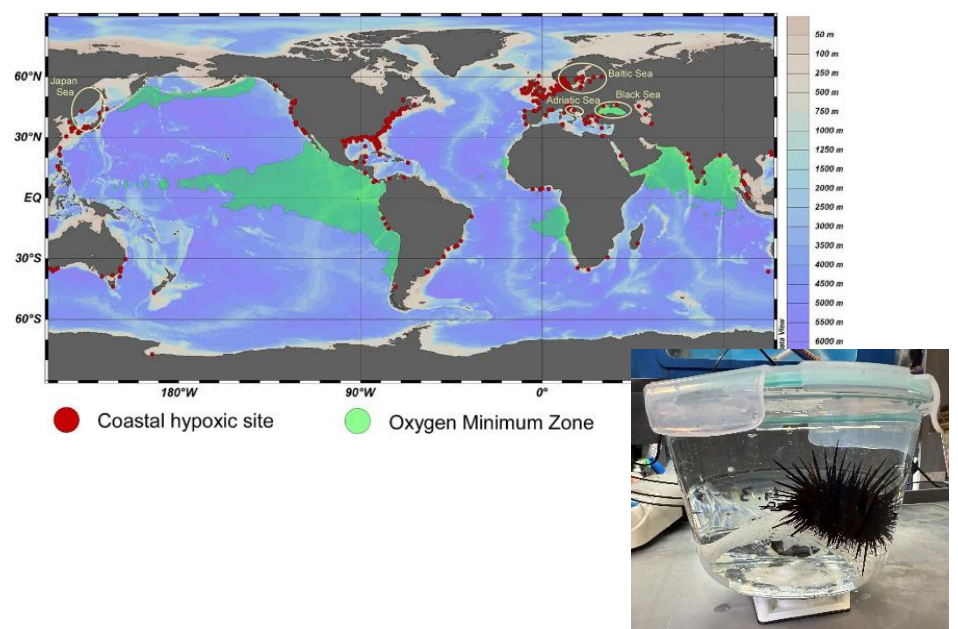
Qualifying  
Seminar

# Ecophysiological Responses of Echinoderms to the Deoxygenated Ocean

**Date: 04 March 2026**

**Time: 10:30 AM**

**Venue: 6N-11**



## About the speaker:

Xiting Zhuang is a PhD candidate supervised by Prof. Juan Diego Gaitán-Espitia. Her research is focused on the physiological responses of *Heliocidaris crassispina* to hypoxia from multiple perspectives.

## Abstract:

As global ocean hypoxia event accelerates, understanding the physiological limits of marine invertebrates is critical for predicting future biodiversity shifts. This research investigates the ecophysiological responses of echinoderms to hypoxia, using the purple sea urchin *Heliocidaris crassispina* as a primary model organism.

First, we establish the critical oxygen partial pressure ( $P_{crit}$ ) for *H. crassispina* to define the threshold at which its metabolic rate becomes oxygen-dependent. Recognizing that sensitivity may shift throughout a species' life history, the study evaluates whether metabolic sensitivity to hypoxia scales with developmental stages, identifying particularly vulnerable periods in the transition from larva to adult. Furthermore, as deoxygenation rarely occurs in isolation, we examine how elevated temperatures alter hypoxia tolerance, testing the potential for synergistic physiological stress. Finally, to contextualize these findings within the phylum, a comparative analysis is conducted to determine if all echinoderms are equally vulnerable to hypoxia or if distinct physiological strategies offer resilience to certain taxa. Collectively, these findings provide essential data on the metabolic constraints of echinoderms in a changing climate, offering insights into the future structure of benthic communities.

