

# iCeMS Kitagawa Group Seminar



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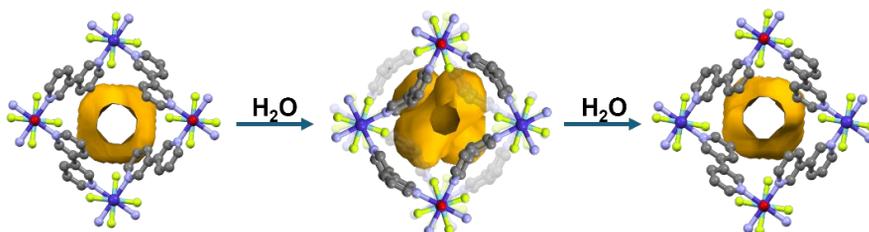
*“From Structural Instability to Functional Potential:  
Designing Water-Responsive Hybrid Ultramicroporous  
Materials for Atmospheric Water Harvesting”*

Date: September 12<sup>th</sup>, 2025

Time: 10:30-12:00

Place: 2F Seminar room, iCeMS main bldg.

**Abstract:** Hybrid Ultramicroporous Materials (HUMs) constitute a modular class of porous coordination networks constructed from metal centers, organic linkers, and inorganic pillars. While HUMs are well established for hydrocarbon separations, they have long been regarded as notoriously water-unstable, limiting their application in aqueous and humidity-driven processes. As a result, examples exhibiting water-triggered structural flexibility are rare, and their potential in atmospheric water harvesting (AWH) remains largely unexplored. In this talk, I will present a new generation of water-stable HUMs, prepared via green synthetic methods, that display reversible structural transformations in response to water vapor. Together, these results demonstrate that overcoming the intrinsic water instability of HUMs unlocks their potential as rationally designed, water-stable, and water-flexible sorbents for AWH.



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