UNIVERSIDADE DE MACAU
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INSTITUTO DE FÍSICA APLICADA E ENGENHARIA DE MATERIAIS
INSTITUTE OF APPLIED PHYSICS AND MATERIALS ENGINEERING

IAPME Seminar

Anomalous Ion Transport in Angstrom-scale Two-dimensional Channels

4 December 2025

Prof. Mingzhan WANG
City University of Hong Kong
Venue: N23-1004b
Time: 16:30 - 17:30
Hosted by: Prof. Pengzhan SUN

Abstract

Recent works on 2D nanofuidies have significantly pushed our understanding of the mass transport in the angstrom-scale confinement, including ion, water and gas, In this talk, I will focus on the ion transport in this regime and will highlight the critical role of confinement chemistry to the anomalously enhanced transport of specific ions. Novel asymmetric ion interplay is also observed e.g. cooperative ion transport. In terms of application, I will describe how to use the 2D nanofludics to separate the critical rare earth elements, showing how strikingly these critical elements behave in such 2D confinement.

Biography

Prof. Mingzhan WANG is currently Global Research Assistant Professor at the City University of Hong Kong (CityU) working with Prof. Wenjun ZHANG. He received his B.Eng. degree from the College of Chemistry of Jilin University in 2013. Afterwards, he obtained his Ph.D. from the College of Chemistry and Molecular Engineering of Peking University in 2018. Then he continued his research in the School of Molecular Engineering of the University of Chicago first as postdoctoral scholar and then as Staff Scientist from 2018 to 2024 before coming to CityU.

His research interest and expertise focus on building a sustainable water-energy-materials nexus, covering the controlled synthesis of 2D materials, energy conversion and storage, angstrom-scale nanofluidics, ion transport, desalination, membrane science and separation. He has authored > 40 peer-reviewed publications with a total citation of ~ 3600, among them 16 as first/corresponding authors in Science Advances, Nature Communications, Nature Reviews Chemistry (accepted), Proceedings of the National Academy of Sciences U.S.A., Advanced Materials, Journal of the American Chemical Society, Matter, Nano Letters, ACS Nano etc.