



## **Department of Materials Science and Engineering Seminar Series 2023**

# **PROGRAMMABLE SELF-ASSEMBLY FOR DESIGN OF LAYERED FUNCTIONAL MEMBRANES**

**Chen Musen**

**01 December 2023, Friday at 9.00 AM**

**Venue: S9, Level 9 conference room**

## **Abstract**

The promising versatility and characteristics of two-dimensional materials-based membranes (2D membranes) give them a conspicuous place in the sustainable creation of functional intelligent materials for diverse practical applications. The research attention still centers on graphene and its derivatives, especially graphene oxide (GO), owing to its amphiphilicity, biocompatibility, water dispersibility, mechanical robustness, low cost, and processability, etc. Self-assembly strategies like vacuum-assisted filtration and blade coating are widely utilized to fabricate 2D membranes, bare or composite. They are simple and easy to operate and can assemble 2D nanosheets with other functional components, e.g., ions, polymer networks, nanomaterials, liquid crystals. However, the self-assembly processes and the relations between structures and related functionalities at this level are not well understood even these days, primarily due to insufficient study. This work aims to: i) develop a green, sustainable, and low-cost platform for programmable self-assembly of 2D membranes with tailored artificial functionalities; ii) understand the mechanism behind the respective self-assembly approaches; iii) bring new insights of structure-functionality relations for 2D stimuli responsive membranes and 2D gas separation membranes by addressing the current research gaps.

## **Biography**

Musen obtained his bachelor's degree in Chemical Engineering (Innovation) from Dalian University of Technology in 2019. He is currently a Ph.D. candidate under the supervision of Assoc. Prof. Daria Andreeva-Baeumler and Prof. Sir Konstantin Sergeevich Novoselov. He deals with fundamental research and practical applications on 2D materials based functional membranes.

**Please join us!**

HOST: Prof. Ding Jun