<Research Topics>

Freestanding Nanomembranes for Enhanced Light-Matter Interactions

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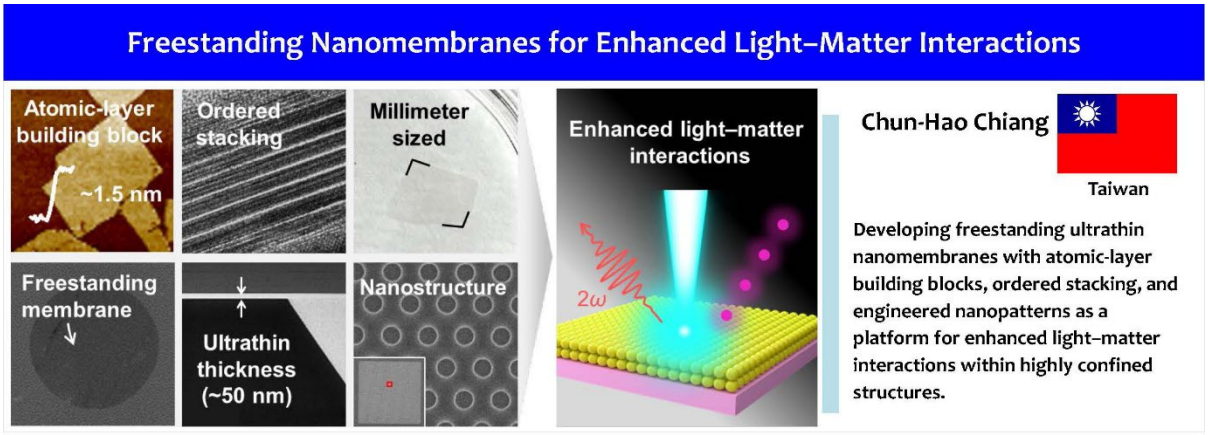

■Research Introduction

Light–matter interactions underpin a wide range of photonic technologies. However, conventional photonic structures are typically much thicker than emerging low-dimensional materials, limiting their interaction with light. My research addresses this challenge by developing freestanding ultrathin nanomembranes assembled from atomic-layer building blocks. By combining ordered stacking with engineered nanopatterns, these membranes support strong optical confinement and enhanced light–matter interactions while maintaining an ultrathin geometry. Through the integration of membrane fabrication, nanostructure engineering, and optical characterization, I aim to establish a versatile membrane photonic platform that enables efficient coupling with low-dimensional materials and advances nanophotonics and quantum technologies.

■About ICYS

ICYS provides a highly international and interdisciplinary research environment where researchers from diverse fields can exchange ideas and establish new collaborations. One particularly valuable aspect of ICYS is the close access to the NIMS Nanofabrication Facility, which offers comprehensive capabilities for advanced nanofabrication and characterization. This integrated infrastructure supports a workflow from material preparation and device fabrication to optical characterization, enabling efficient validation of new research ideas. Such a research framework provides an excellent foundation for interdisciplinary research in advanced materials and photonics. What I find most attractive about ICYS is the freedom to pursue independent research. It provides a unique opportunity to lead my own research project and shape my long-term research vision at an early stage of the career.

■Link

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