

Defect control in 2D materials: From magnetism to optoelectronic and bio-applications

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Date: Friday, April 21, 2023 15:00-16:00

Venue: Faculty of Engineering Bldg. 2, 31A

Abstract:

A long-standing puzzle in the field of 2D materials is the effect and understanding of different types of defects in their electronic, magnetic, catalytic and optical properties. In this talk an overview of different defects in TMD and hBN monolayers will be presented. We will define the dimensionalities and different atomic structures of defects and discuss how these defects could be imaged with novel optical-driven techniques. We will emphasize doping and alloying in monolayers of MoS_2 , WS_2 , and WSe_2 and describe their implications in magnetism, as well as in electronic transport. We will also describe the catalytic effects of edges, vacancies and local strain observed in hBN and $\text{Mo}_x\text{W}_{(1-x)}\text{S}_2$ monolayers by correlating the hydrogen evolution reaction (HER) with aberration corrected scanning transmission electron microscopy (AC-HRSTEM). Finally, we will show that cells are capable of ingesting fluorescent WS_2 monolayers so these 2D materials could be used as efficient biomarkers. Insights into cell ingestion and fluorescence dynamics will be discussed.



Registration
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