



Seminar announcement

Tuesday, January 21, 2025

2:00 pm

WSI, Seminar room S 101

Exclusively in person

“Exploring the tunability of MoS₂: Insights from scanning probe microscopy ”

The physical properties of semiconducting transition metal dichalcogenides (TMDs) have been proven to be influenced by a variety of parameters, including the number of monolayers, strain, interlayer twist angle, charge transfer, and hydrostatic pressure. Among the TMDs, molybdenum disulfide (MoS₂) stands out due to its exceptional tunability in both optoelectronic and elasto-mechanical properties, making it a prime candidate for material engineering.

In this talk, we will review the tunability of MoS₂ and we will delve into the effects of engineered strain on MoS₂ monolayers (MLs). Using scanning probe microscopy techniques — including nano-indentation atomic force microscopy, electrostatic force microscopy, and scanning tunneling microscopy — we will demonstrate how engineered MoS₂ achieves remarkable electronic and mechanical performances, from superconductivity to superelasticity, and how the strain can significantly influence its charge carrier density, defect states, and ultimately, its density of states.

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