S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES
Block JD, Sector III, Salt Lake, Kolkata 700 106

DEPARTMENTAL SEMINAR

Condensed Matter and Materials Physics

11th September, 2023 **4.00 PM** **ONLINE/ FERMION**

SPEAKER
Prof. Joy Mitra
Professor, School of Physics
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TITLE OF THE TALK

ENGINEERING STRAIN INHOMOGENEITIES IN MOS2 FLAKES

ABSTRACT

The extraordinary mechanical properties of 2D TMDCs make them ideal candidates for investigating strain-induced control of physical properties. Here, we explore the role of non-uniform strain in modulating optical, electronic and transport properties of semiconducting, chemical vapour deposited monolayer MoS2 draped over periodically nanostructured substrates. A combination of spatially resolved spectroscopic and electronic properties explore the differential strain distribution and carrier density in a monolayer as it conformally drapes over the periodic nanostructures. The observed accumulation in electron density at the strained regions is supported by theoretical calculations, which form the likely basis for the ensuing ×60 increase in field effect "mobility" in strained samples. Though spatially non-uniform, the pattern induced strain is shown to be readily controlled by changing the periodicity of the nanostructures, thus providing a robust yet useful macroscopic control on strain and mobility in these systems.

HOST FACULTY

Prof. Priya Mahadevan, Senior Professor

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