Seminar/Talk

Metal-Insulator Transition and Interlayer Coupling in Nickelate-based Heterostructure

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Host:

In recent years, complex-oxide heterostructures have garnered much attention due to the many routes (i.e. strain, charge transfer, reduced dimensionalities, etc.) they offer to tune the already outstanding properties of these materials and also allow novel functionalities to be engineered.
In this presentation, we will focus on nickelate-based heterostructures. Perovskite nickelates (RNiO3, R=rare earth), with the exception of LaNiO3, display a metal-insulator transition (MIT) and antiferromagnetic order in the low temperature phase. Tuning of the MI and Néel transitions is efficiently achieved in nickelate thin films over a wide temperature range, and even ultrathin LaNiO3 films undergo a MIT as the thickness is reduced. I will also report how interface engineering can be used not only to induce a new magnetic phase in the otherwise non-magnetic LaNiO3 but also to generate rich and complex magnetic behaviour in (111)-oriented LaNiO3/LaMnO3 heterostructures. For 7-monolayer-thick LaNiO3/LaMnO3 superlattices, the emergence of negative and positive exchange bias is observed at low temperature before the stabilization of an antiferromagnetically-coupled state between the LaMnO3 layers.

Wednesday, March 8, 2017 09:45am - 10:45am
Mondi Seminar Room 2, Central Building

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