The role of strain in thin film heterostructures

tutorial

September 4, 2019 | 4:00 pm
Lecture Hall MPI | B.1.11

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Abstract

Strain can be induced in thin film heterostructures mainly caused by a difference in lattice parameters between the film and the underlying substrate. In correlated transition metal oxide systems, strain significantly affects diverse physical properties of the thin films, such as ferroelectricity, magnetic ordering, electron mobility, electrocatalysis, and superconductivity.

In this talk, I will introduce an enhancement of ferroelectric photovoltaic effects in compressively strained thin films because of increased ferroelectric polarizations and reduced band gaps. Strain can be further exploited to accelerate exsolution of nanoparticles in thin film heterostructures for catalytic and renewable energy applications.

Finally, I will discuss artificially imposed room-temperature multiferroicity in rare-earth ferrite thin films implemented by ferroelectric-ferromagnetic morphotropic phase mixtures.

Speaker

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