Stabilization of ferromagnetism with bulk-like Curie temperature in ultrathin manganite films

Ionela Vrejoiu
Max Planck Institute for Solid State Research, Stuttgart, Germany

Pulsed laser deposition of epitaxial films of $(La_{0.7}\ A_{0.3})MnO_3$ (A= Ca, Sr or Ba) on various substrates and their magnetic and transport properties have been intensively investigated.

Most of the times these manganite films, especially when they are thinner than about 5 unit cells, show large deviations from the bulk properties, with severe decrease of ferromagnetic transition temperature and increase of electric resistivity.

I will present our investigations of $(La_{0.7}Sr_{0.3})MnO_3$ films, superlattices of $(La_{0.7}Sr_{0.3})MnO_3/SrRuO_3$ and tri-layers of $SrRuO_3/(La_{0.7}Ba_{0.3})MnO_3/SrRuO_3$, with ultrathin manganite layers (≤ 3 unit cells), deposited on $SrTiO_3$(100) substrates. We show that the manganite layers of these superlattices and tri-layer samples show ferromagnetic order at temperatures close to the bulk Curie temperature.