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Exchange interactions at the manganite/manganite interface of FM/AFM type

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Understanding interface phenomena is one of the greatest challenges in both fundamental and applied physics. In particular, interfaces made of strongly correlated oxides have shown unexpected physical properties, such as the exchange bias, proximity effects, charge transfer, exchange springs and orbital reconstruction [1-3]. Given the complexity of its structural and magnetic phase diagram, LSMO offers a wide range of tunable properties that we can stack into heterostructures. With the atomic precision of the oxide MBE we were able to tune the Sr-concentration x layer by layer (at 0.4 obtaining a ferromagnetic half-metal and at 0.8 an antiferromagnetic insulator), and synthesize superlattices with a large gradient in hole doping, as a promising platform to study the competition between diverse exchange interactions, such as exchange bias and charge transfer.

In this talk, we will discuss the results obtained by polarized neutron reflectometry and SQUID magnetometry of these heterostructures, while trying to shed light on the macroscopic and local magnetic properties and their connection to the Sr-doping depth profile.

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2. J.-H. Kim, I. Vrejoiu, Y. Khaydukov, T. Keller, J. Stahn, A. Rühm, D. K. Satapathy, V. Hinkov, and B. Keimer, Phys. Rev. B 86, 180402(R)
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Primary authors: GUASCO, Laura; KHAYDUKOV, Yury (Max-Planck Institute for Solid State Research); KIM, Gideok (1Max-Planck-Institute for Solid State Research, Stuttgart, Germany); KELLER, Thomas (MPI for Solid State Research, Stuttgart); LOGVENOV, Gennady (1Max-Planck-Institute for Solid State Research, Stuttgart, Germany); VOROBIEV, Alexei (Department of Physics and Astronomy, Uppsala University, Uppsala 751 20, Sweden); WOCHNER, Peter (Max-Planck-Institute for Solid State Research, Stuttgart, Germany); Prof. KEIMER, Bernhard (MPI for Solid State Research)

Presenter: GUASCO, Laura

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