

On Thursday 14 May at 2:30 pm Hengbo Zhang (JCNS-2) will hold, by digital means, a seminar talk whose title and abstract are given below.

**Title: Influence of oxygen stoichiometry onto the physical properties of complex oxide thin films**

**Abstract:**

Oxygen vacancies play a crucial role for controlling physical properties in complex oxides. The oxygen stoichiometry can be tuned e.g. via absorbing or desorbing oxygen and by this modifying the lattice structure, magnetization and electronic transport properties. This provides the possibility for technological applications, e.g. in information storage, catalysis or sensorics.

In a previous study of  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$  (LSMO), thin films were grown at large oxygen pressures on single crystal substrates  $\text{SrTiO}_3$  and a perfect perovskite structure was obtained. However, in this study here, LSMO thin films are grown at lower oxygen pressures. As in the proceeding study the samples are grown by High Oxygen Pressure Sputter Deposition

(HOPSD) at various growth parameters in order to study the influence of the growth parameters onto the structural and physical properties.

Moreover, after preparation various methods have been investigated to deoxygenate the LSMO films, i.e. vacuum annealing, reductive gas annealing, e.g. in ammonia, and titanium-sponge assisted oxygen desorption. By vacuum annealing the oxygen-deficient brownmillerite phase is prepared from the as-prepared perovskite phase. The magnetic and electronic transport properties evidence that the system becomes antiferromagnetic and insulating.

In addition, for a better understanding of the magnetic behavior of the system, Polarized Neutron Reflectivity (PNR) had been employed to study the magnetic depth profile of the as-prepared system as well as of the oxygen-deficient system.