

Contact us if you are interested in a bachelor or master project:

- simon.joehr@uzh.ch
- marta.gibert@ifp.tuwien.ac.at



Simon Jöhr



Jonathan Spring



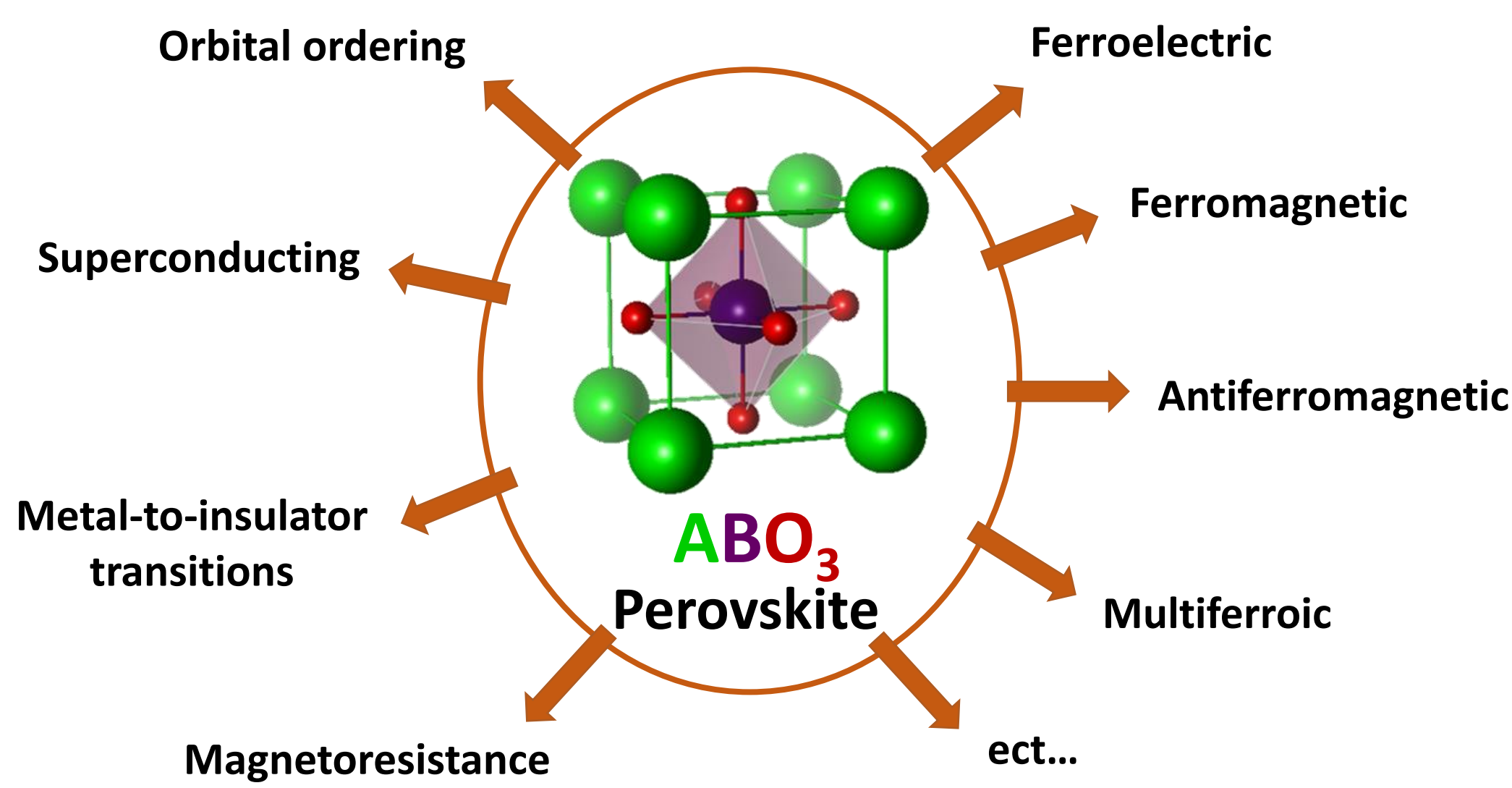
Marta Gibert



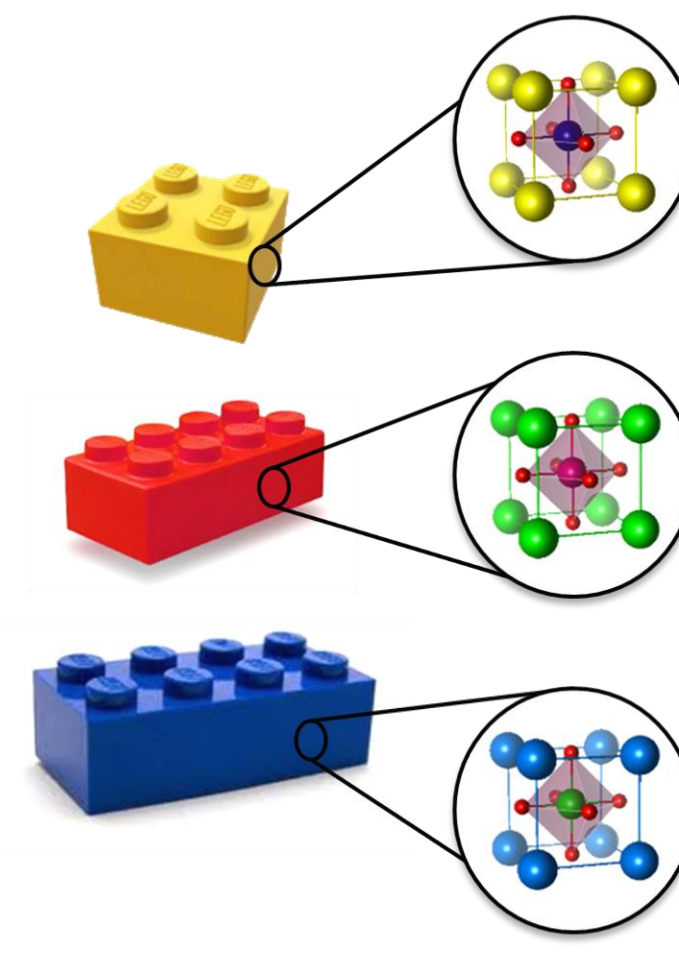
<https://www.physik.uzh.ch/en/groups/gibert.html>

Introduction: Why Oxide Interfaces?

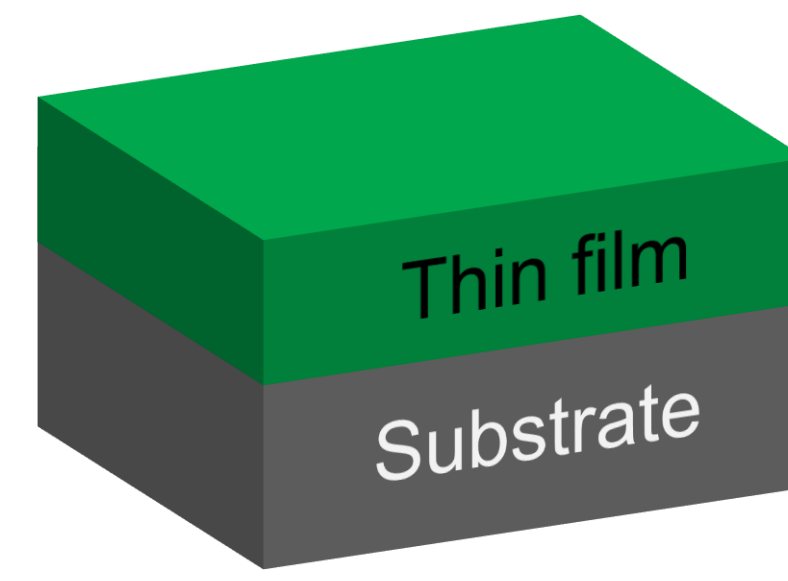
Perovskite oxides have a large spectrum of properties emerging from strong correlations and interactions.



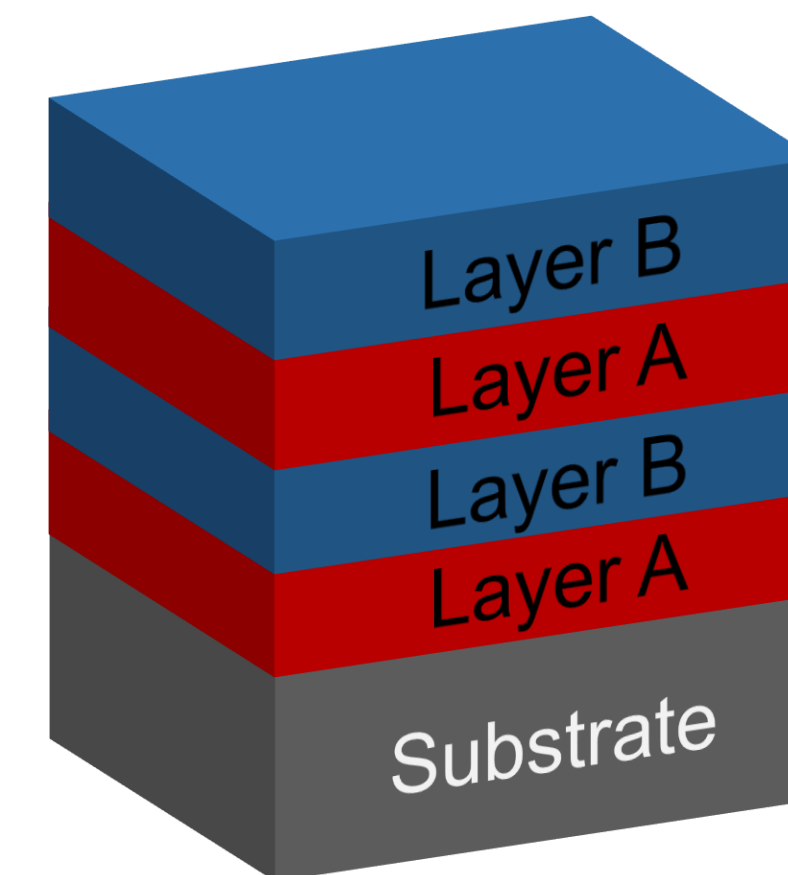
Stacking oxide layers in form of thin films or superlattices, creating interfaces, allows us to tune their functionalities and even generate new properties, opening a gate to novel applications.



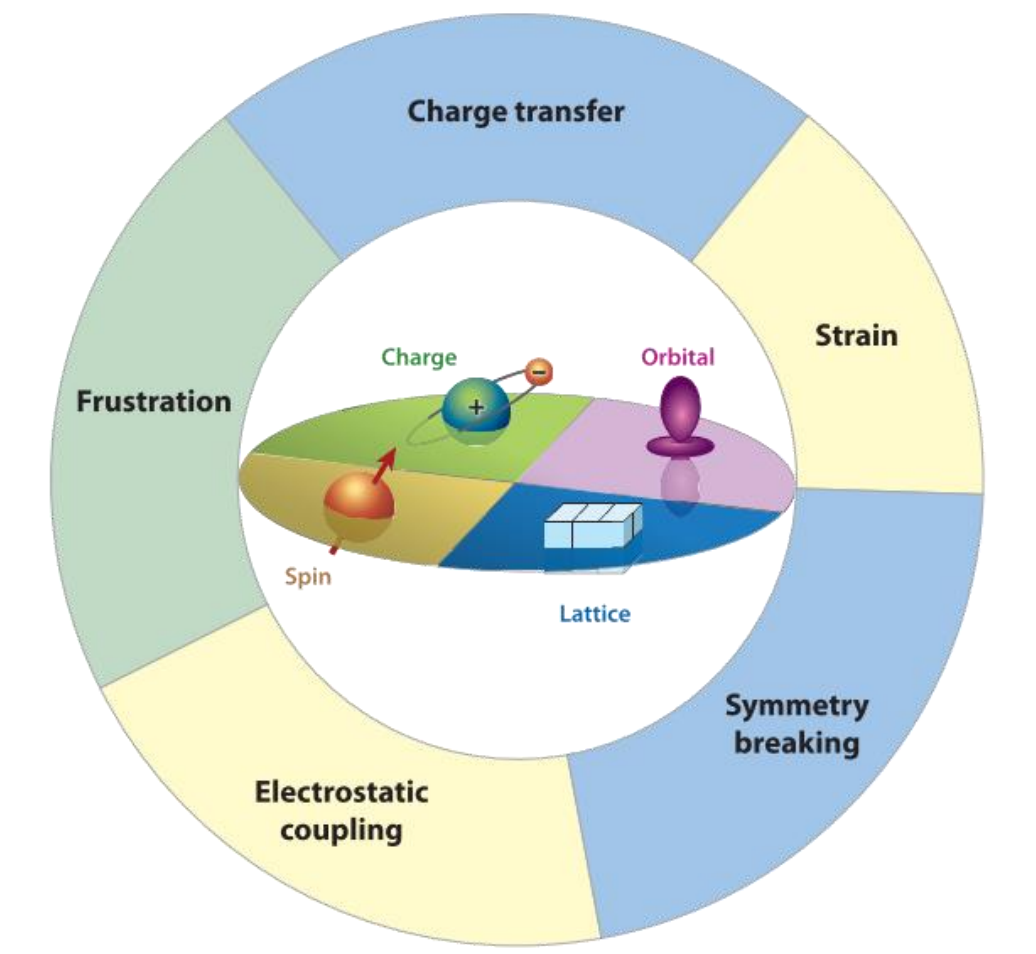
Building block



Thin film

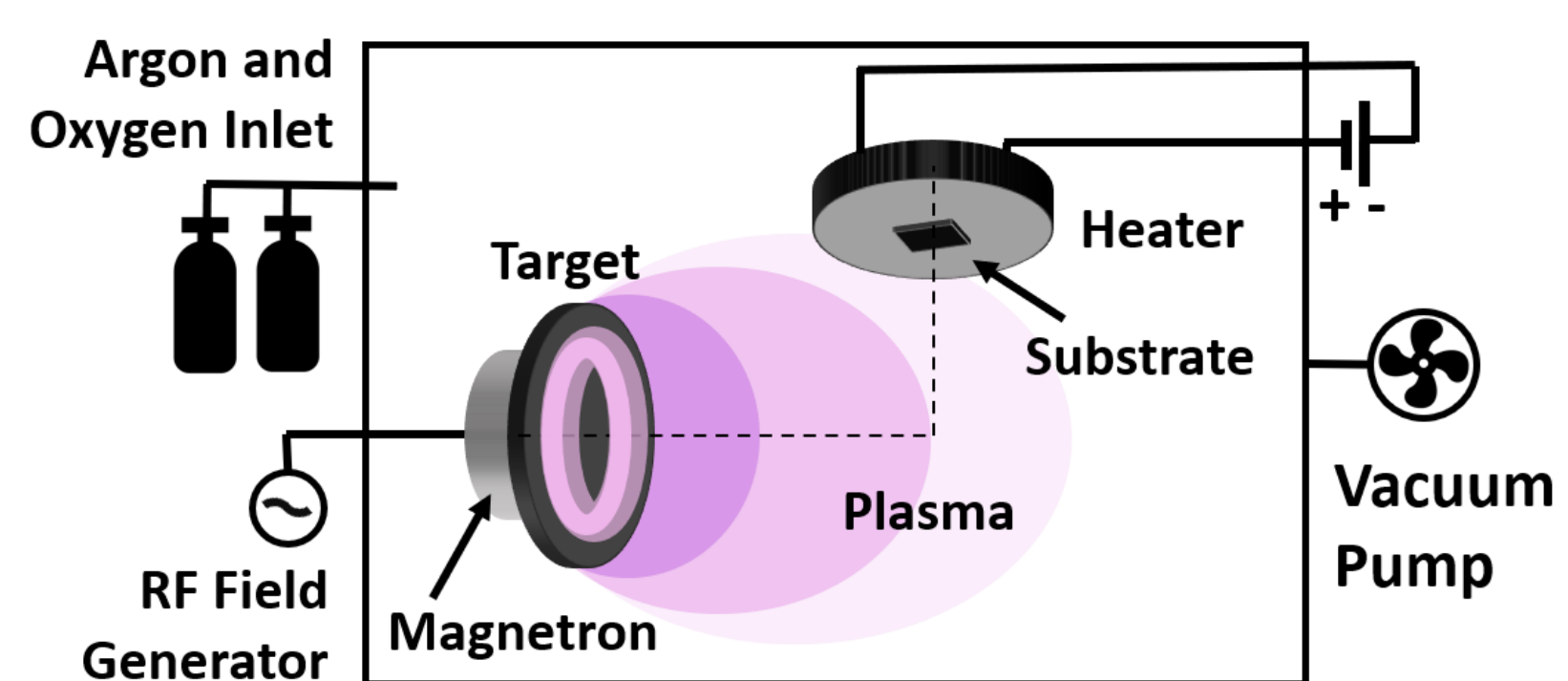
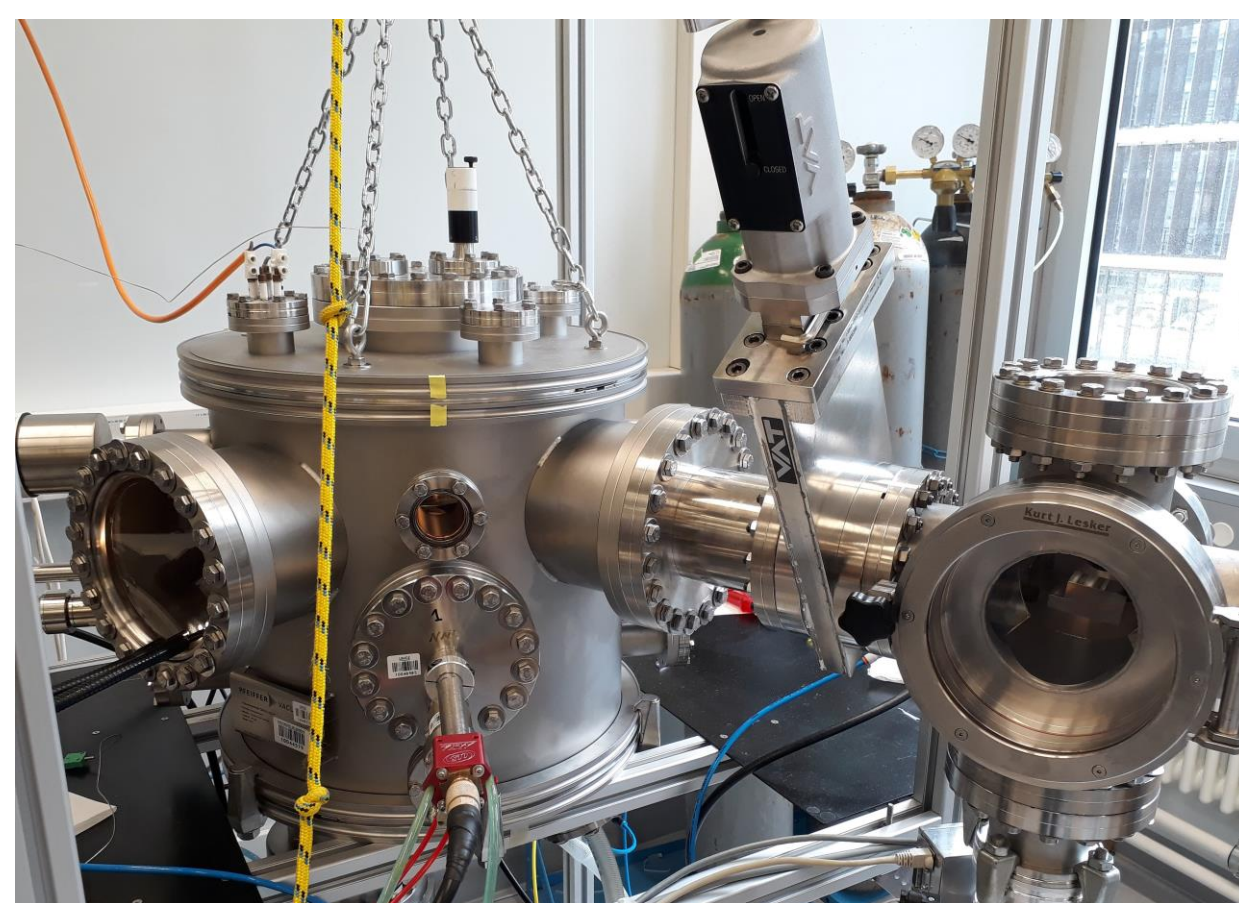
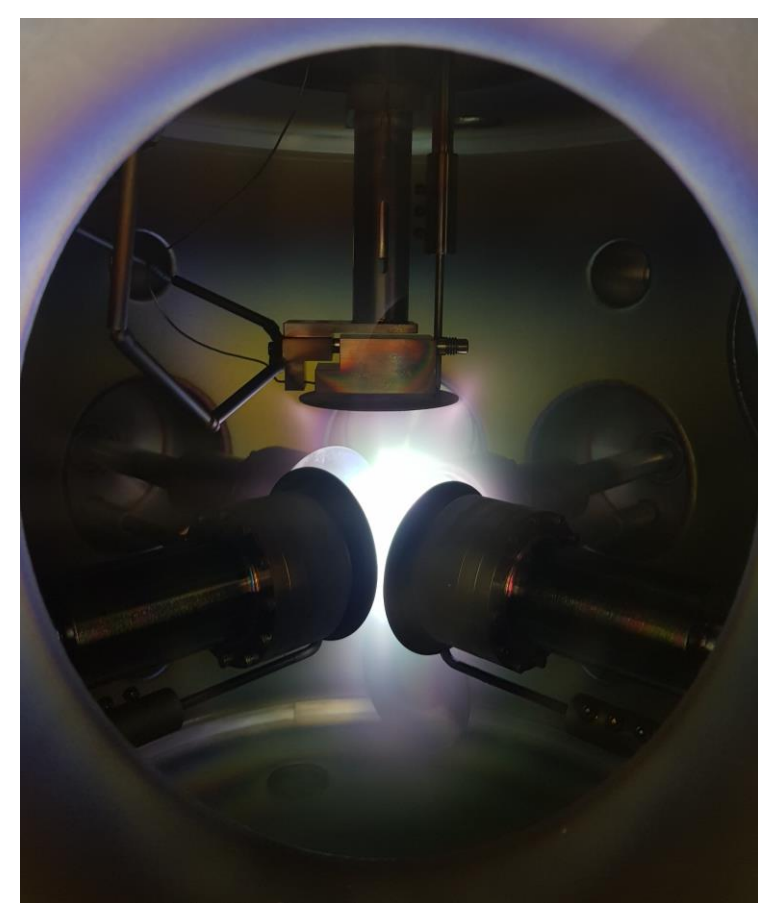


Superlattice

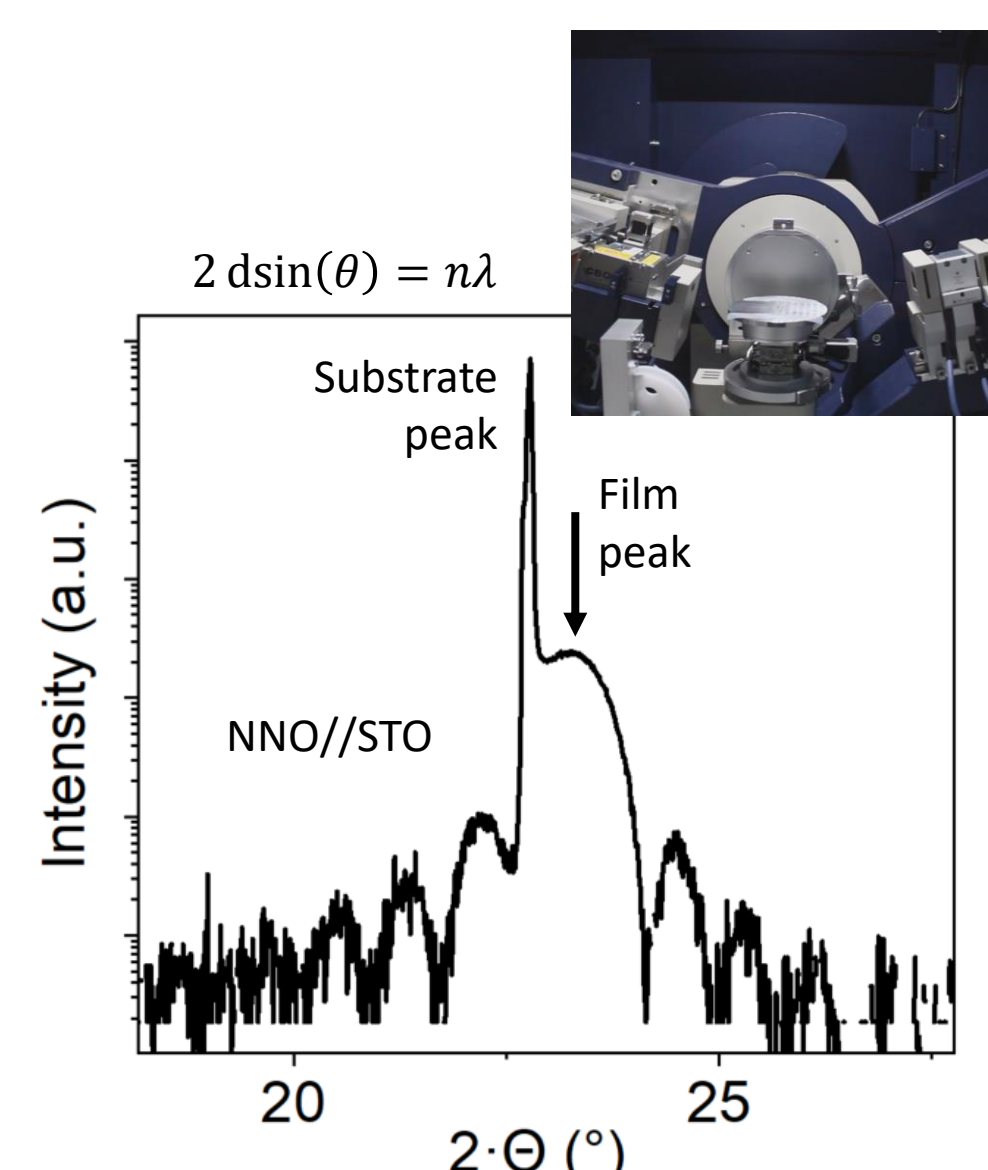


Tuning of functionalities

Methods: From Growth to Characterization

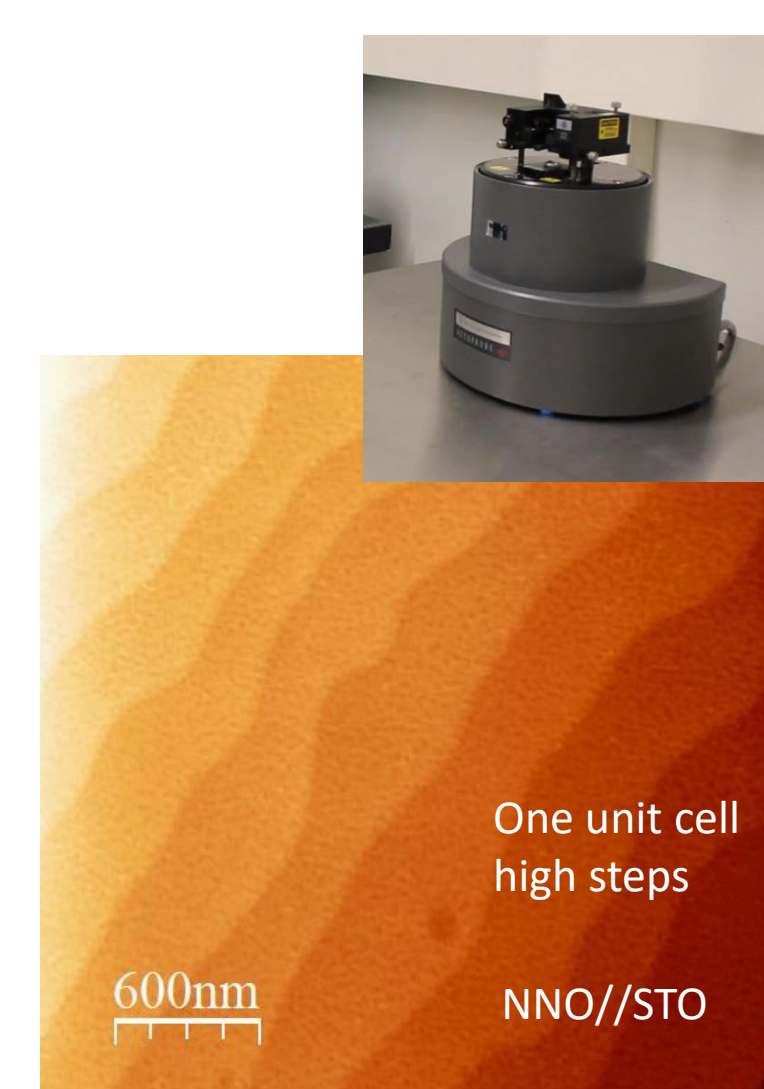


Off-axis RF magnetron sputtering



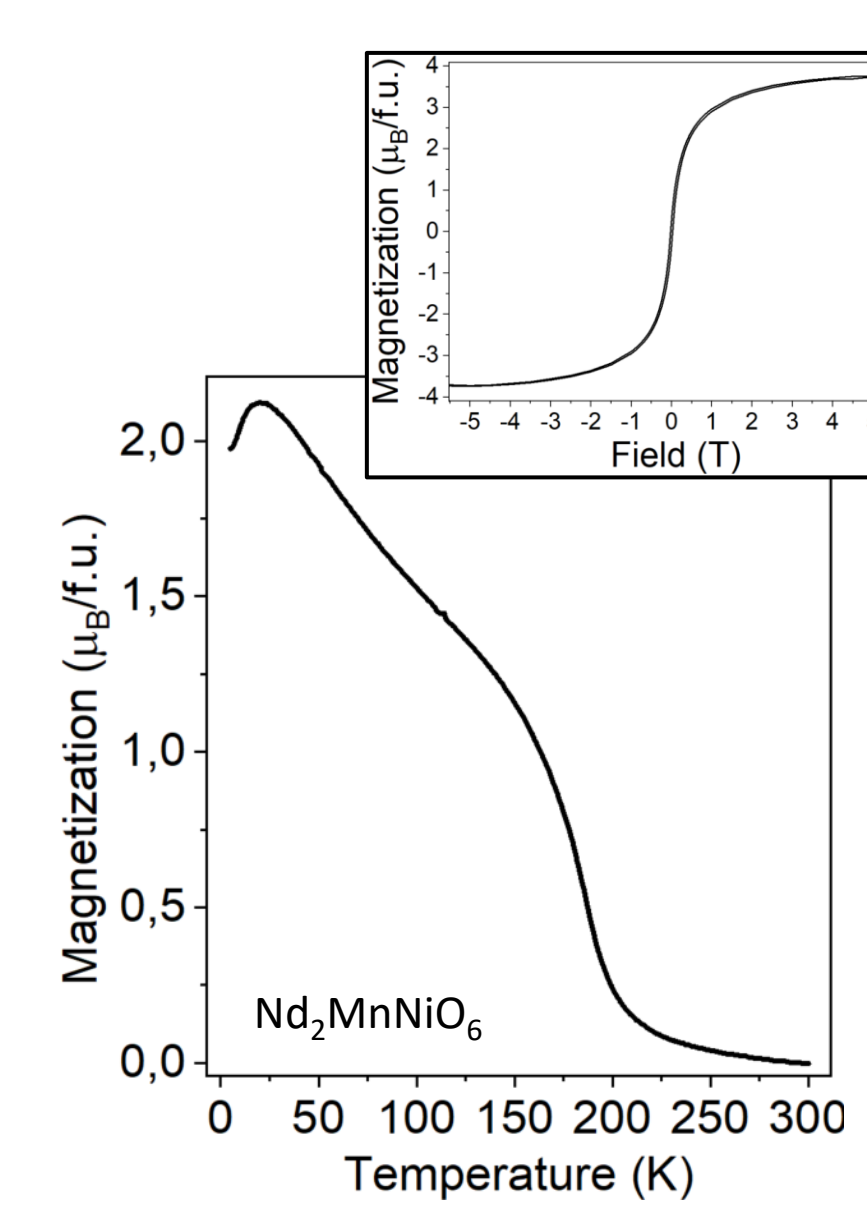
X-ray diffraction (XRD)

Information about the structural quality



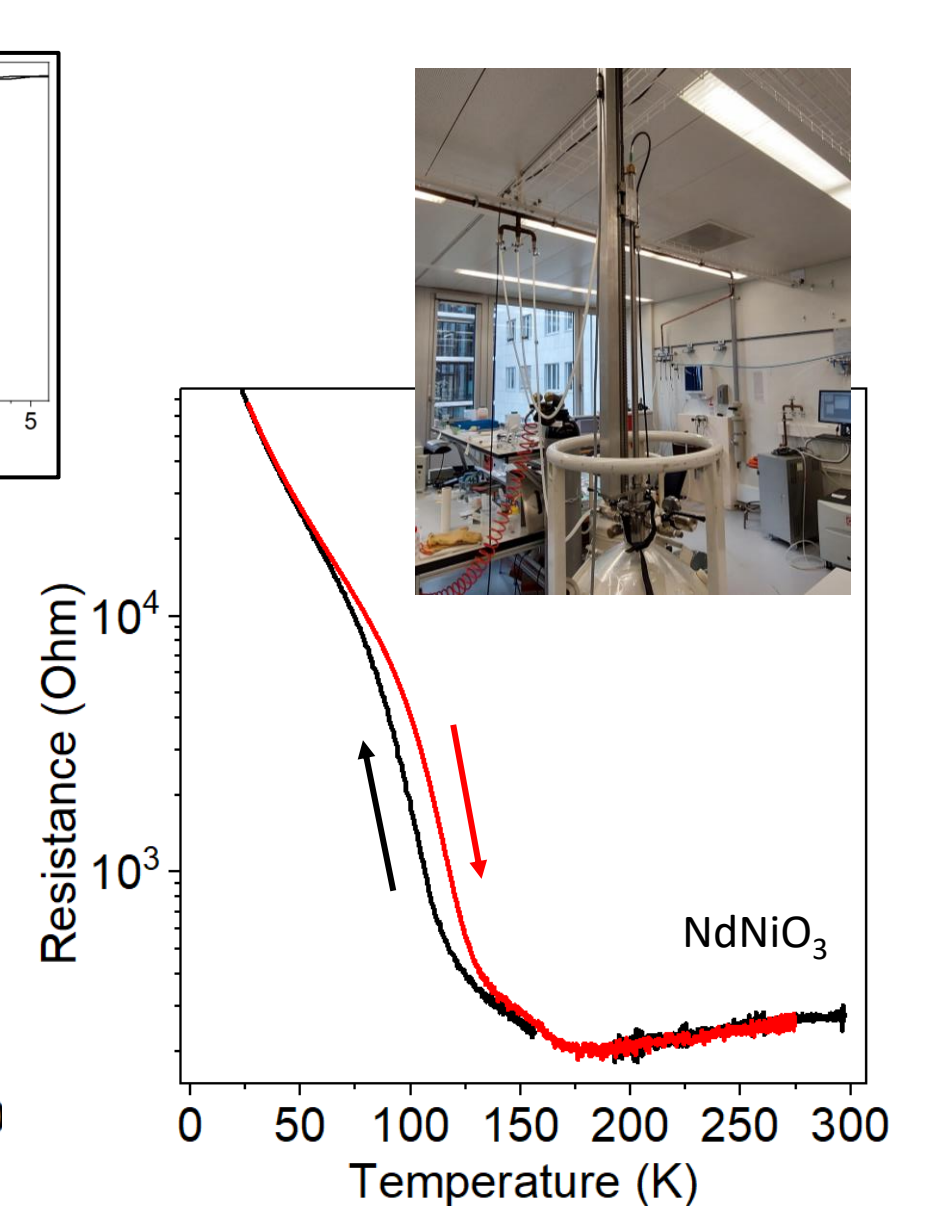
Atomic Force Microscopy (AFM)

Probe of the surface quality (new device coming soon!)



Magnetometry (SQUID)

Measurement of the magnetic response

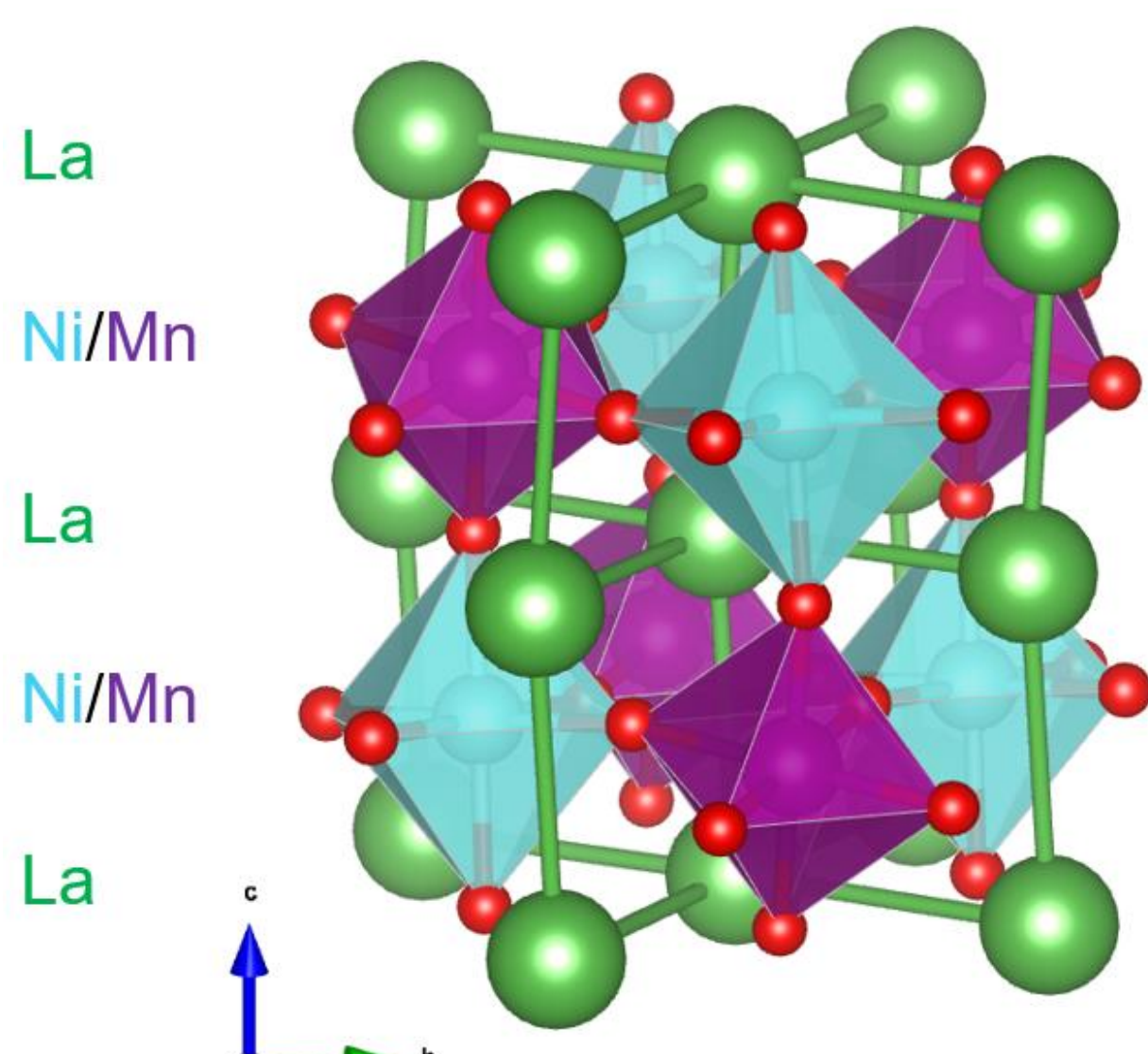


Transport

Quick RT: A fast and easy way to measure the resistivity (self-made)

Our Current Projects

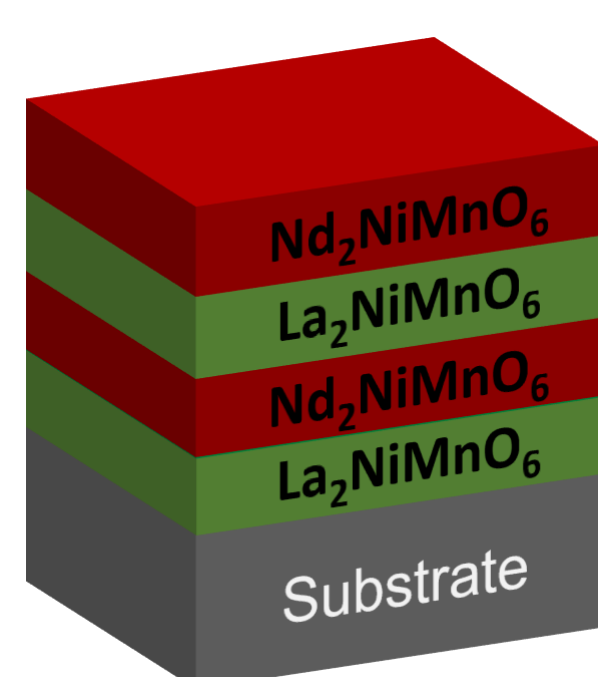
Double Perovskite & Superlattices



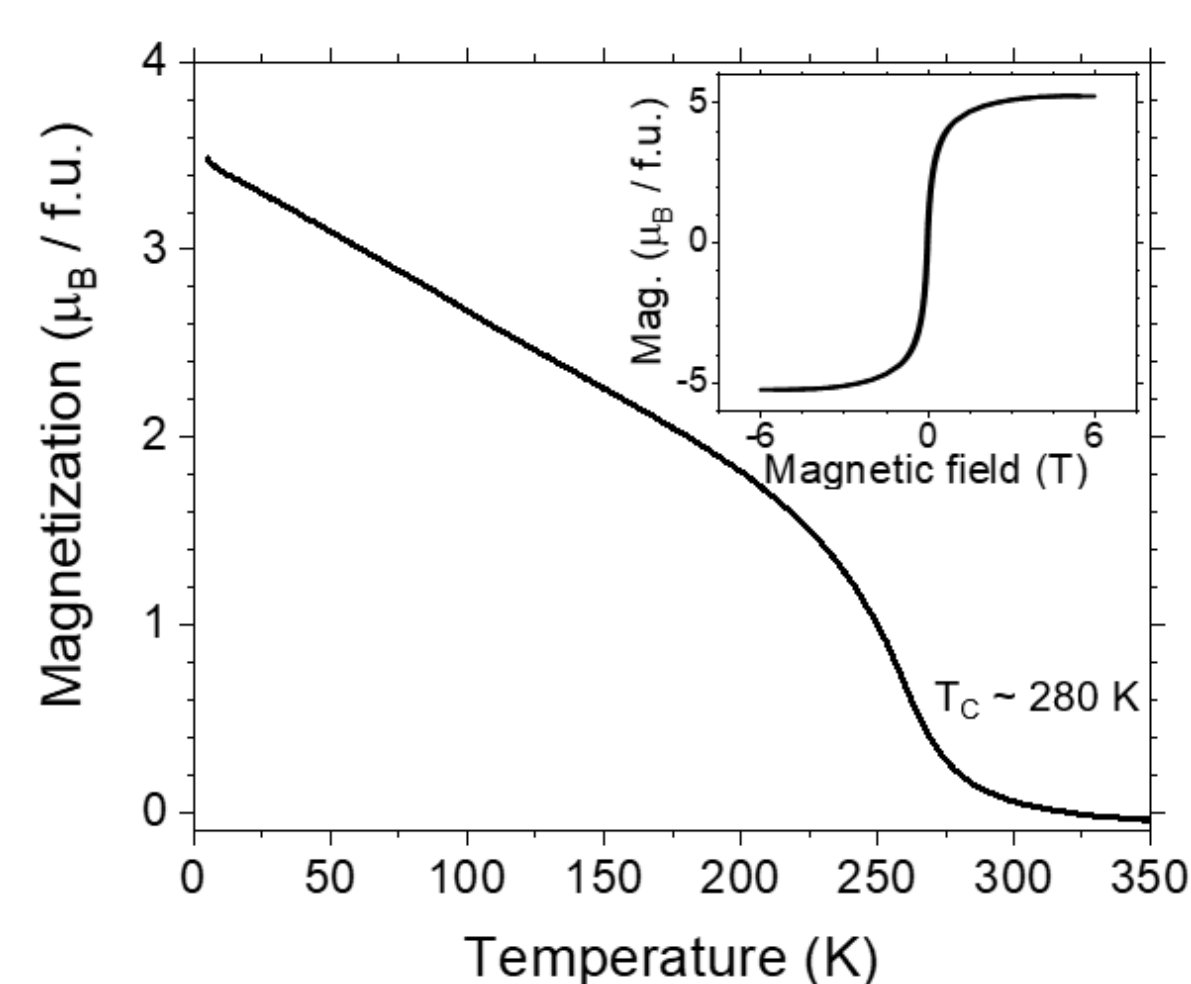
$\text{La}_2\text{NiMnO}_6$ is a ferromagnetic insulator with near room temperature transition.

Rock-salt ordering of the NiO_6 and MnO_6 octahedra leads to ferromagnetic superexchange.

Outlook



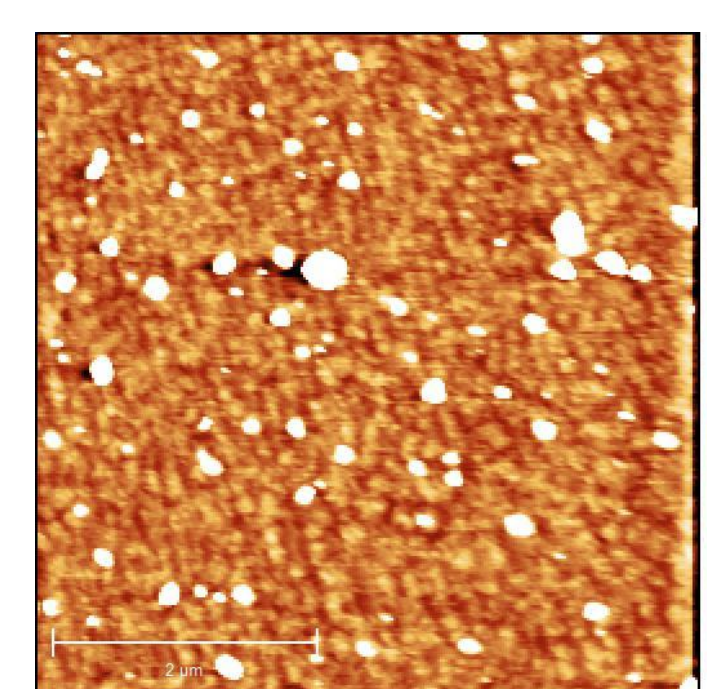
Superlattices of $\text{La}_2\text{NiMnO}_6$ and $\text{Nd}_2\text{NiMnO}_6$ are expected to be multiferroic (i.e. ferromagnetic and ferroelectric)



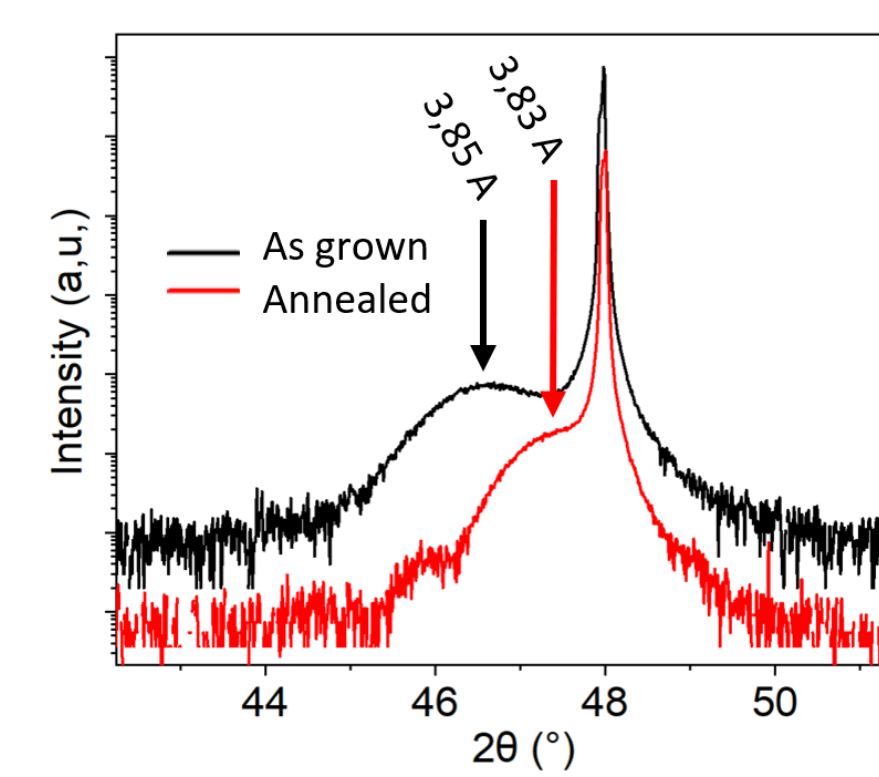
Ferromagnetic properties of a 10 nm film grown on SrTiO_3 substrate

Unusual Behaviour in Chromates

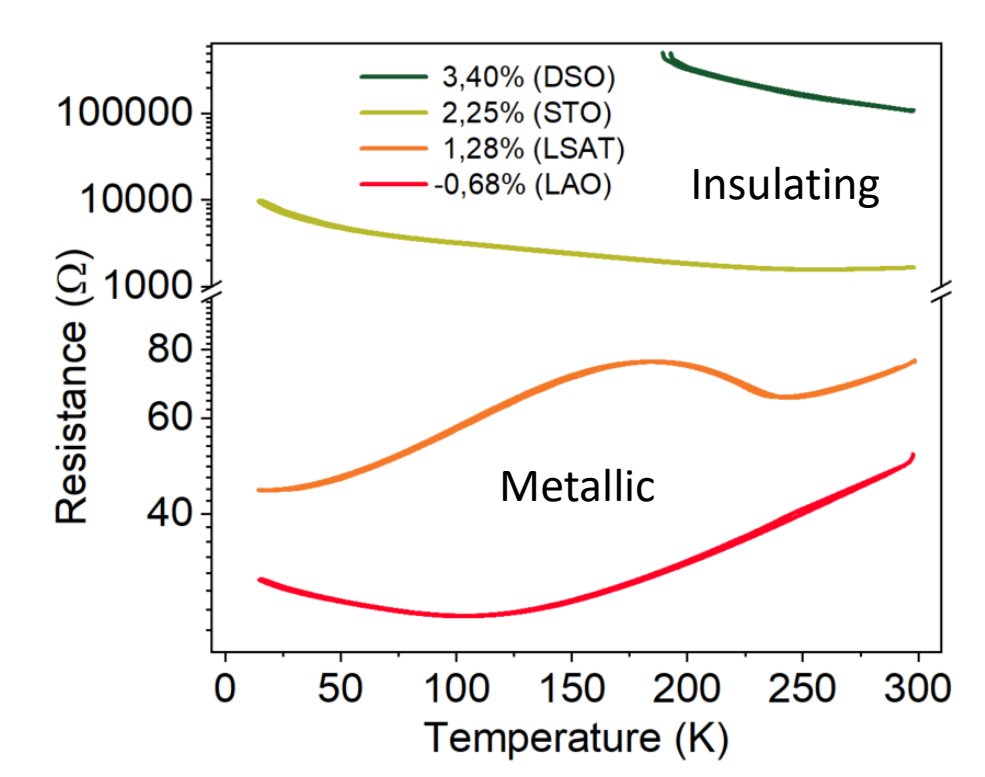
SrCrO_3 combines a metallic and antiferromagnetic behaviour. This feature is very unusual and poorly understood.



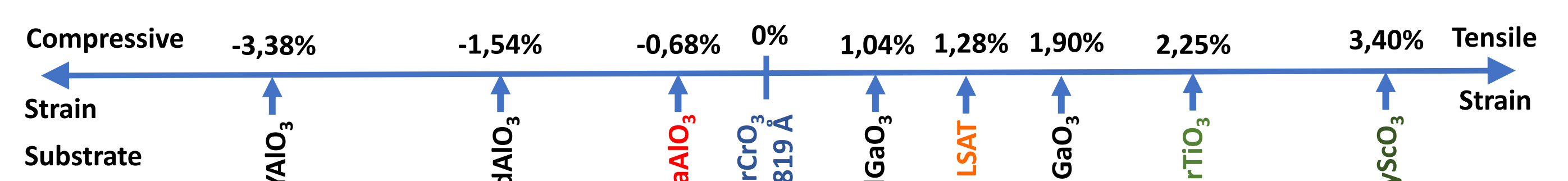
AFM image of the SCO film surface



Effect of annealing on the film c-axis

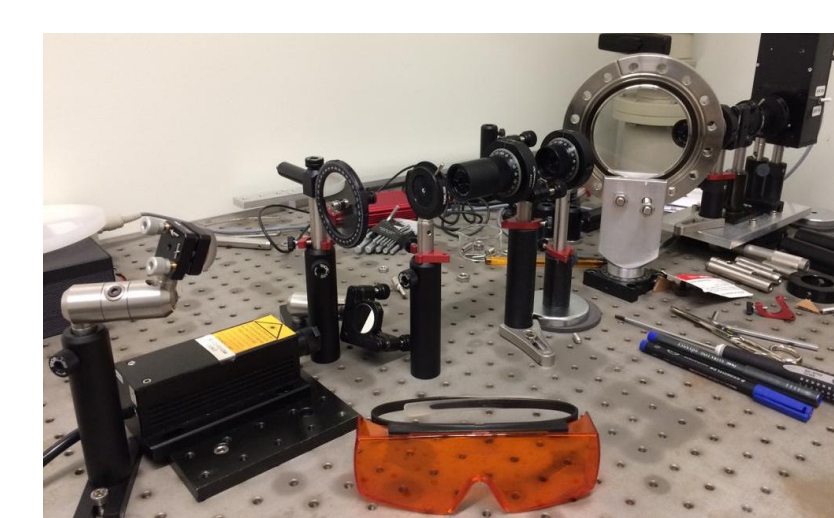
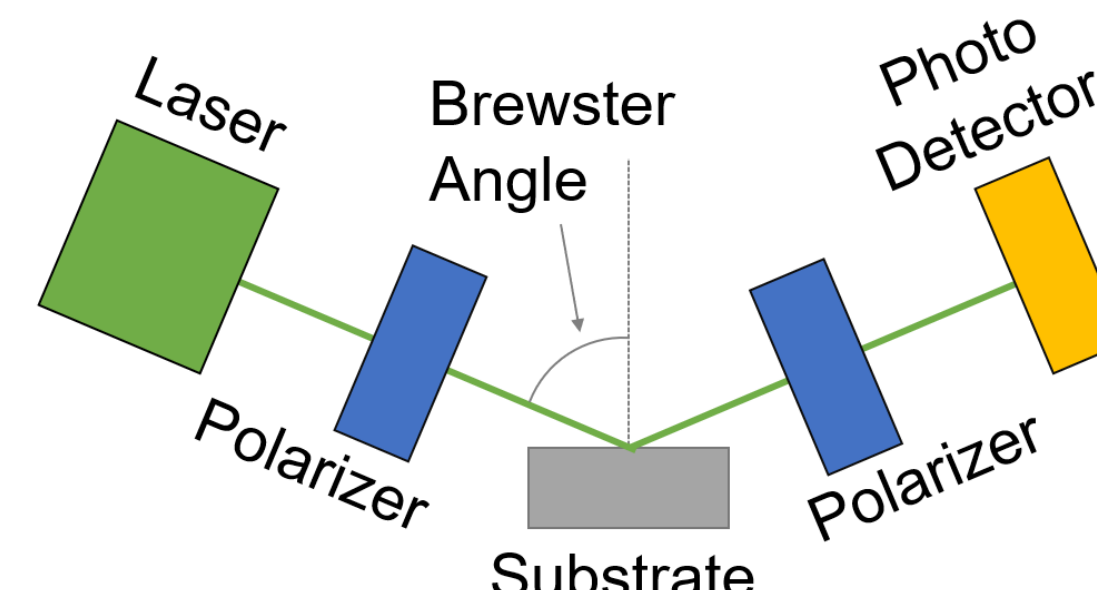


Strain-driven metal to insulator transition



Optical Growth Monitoring

We explore the possibility to monitor the film growth in real time. In-situ polarized optical reflectivity represents a simple non-intrusive solution.



Work in Progress!

If you are interested, don't hesitate to ask for a lab-tour!