

## Structural and electronic coupling at oxide interfaces

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In this talk, I will discuss several interfacial couplings that occur in oxide heterostructures. Polar discontinuities can lead to 2-dimensional conduction between insulating materials – I will briefly discuss the case of the LaAlO<sub>3</sub>/SrTiO<sub>3</sub> system [1,2]; Structural and electronic coupling at oxide interfaces can also lead to interesting phenomena that we investigated in perovskite nickelates - well-known for their metal to insulator transition (MIT) and unique antiferromagnetic (AFM) ground state [3-5] – there, I will show that NdNiO<sub>3</sub>/SmNiO<sub>3</sub> superlattices display, depending on the thickness of the individual layers, a single or double MIT - a behavior that allows the role of interfacial structural and electronic coupling in heterostructures to be studied. Finally I will present results on vanadate-based heterostructures where we aimed at designing an artificial ferroelectric material [6,7]. In this system, the interface sharpness seems to be controlled by the coupling of distortions and periodicity of the structure.

### References

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