

Abstract Submitted  
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**Polarization discontinuities and compensation mechanisms at oxide-oxide interfaces** MASSIMILIANO STENGEL, ICMAB (CSIC), DAVID VANDERBILT, Rutgers University — Polar interfaces between insulating perovskite materials have been the subject of special attention in the past few years, following the discovery of two-dimensional conductivity in  $\text{LaAlO}_3/\text{SrTiO}_3$ . In this talk I will introduce the problem by using general concepts of macroscopic electrostatics, in the framework of the modern theory of polarization [1]. Based on these ideas, I will show how we can understand the origin and the spatial distribution of the metallic electron gas in terms of few basic ingredients, which can be readily extracted from bulk calculations of  $\text{SrTiO}_3$ . These results provide an unified view over the factors determining the confinement and decay of the compensating free charge within arbitrary electrical boundary conditions.

[1] M. Stengel and D. Vanderbilt, Phys. Rev. B 80, 241103(R) (2009).

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