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Titolo	PROBING OXIDE HETEROSTRUCTURE INTERFACES THROUGH ANGLE RESOLVED AND RESONANT ELECTRON SPECTROSCOPIES [Tesi di dottorato]
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Sommario	In the recent years, electronic devices have become smaller and faster, as well as more powerful and efficient. However, the size of the building blocks of the current electronics - i.e. the transistors - is quickly approaching the limits of manufacture. The need of a new generation of devices based on novel mechanisms is today essential. In this scenario, well-defined interfaces between oxide materials have produced novel electronic systems displaying a spectacular variety of properties with promising potentialities for future devices, such as colossal magnetoresistance, high-temperature superconductivity, magnetism at the interface between non magnetic oxides, as well as two-dimensional electron gas between two oxide insulators. Indeed, interfaces between perovskite oxides - e.g. the LaAlO3/SrTiO3 – have shown properties at the nanometer scale that are qualitatively different from their single building blocks, allowing one to engineer novel functionalities through the growth of epitaxial heterostructures. Nevertheless, both atomic and electronic reconstructions could be present in oxide interfaces when a polar discontinuity occurs at the junction and the possibility to probe non-destructively the cation depth profiles can provide further insight into the oxide heterointerface physics. This is also true for less-ordered systems - i.e. amorphous thin films - which are playing a key role in the development of new architectures in photovoltaic

	applications, such as the CdxSnyOz/TiO2 heterojunction. In this Thesis, the combination of chemical and structural information on a local scale (i.e. at the interface and the nearby few atomic layers) has been obtained by combining an effective modeling of angle-resolved x-ray photoemission data, with synchrotron based electron spectroscopy techniques. It is shown how in oxides the interfacial electronic properties can be driven by complex substitutional effects across the interface, such as stoichiometry gradients, cation vacancies and interdiffusion, as well as by the presence of interfacial/surface oxygen vacancies.
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