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**Spectroscopic findings in SrTiO₃ applications: LaAlO₃/SrTiO₃ and La₀.₇Sr₀.₃MnO₃/SrTiO₃ heterostructures**

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Recently, a number of transport and magnetization studies have shown signs of exotic functionalities in SrTiO₃ based heterostructures, which are totally unexpected properties with no bulk analog in the constituent materials. However, it is still early stage to understand such a functionality, which limits improving SrTiO₃ applications. For this reason, we performed spectroscopic studies on the SrTiO₃ based heterostructures, such as LaAlO₃/SrTiO₃ and La₀.₇Sr₀.₃MnO₃/SrTiO₃ using element-specific techniques. For example, we found direct evidence for in-plane ferromagnetic order at the interface, with Ti³⁺ character in the $d_{xy}$ orbital of the anisotropic $t_{2g}$ band in LaAlO₃/SrTiO₃ heterostructure. Also, we found that the unexpected metal to insulator transition in La₀.₇Sr₀.₃MnO₃/SrTiO₃ is due to changes in Mn 3$d$-electron confinement. These findings establish a striking example of emergent phenomena at oxide interfaces. In this presentation, I will introduce more details of spectroscopic findings on those heterostructures.