

## POST-DOC : Electronic properties of 2D electron gas at the interface between complex oxides

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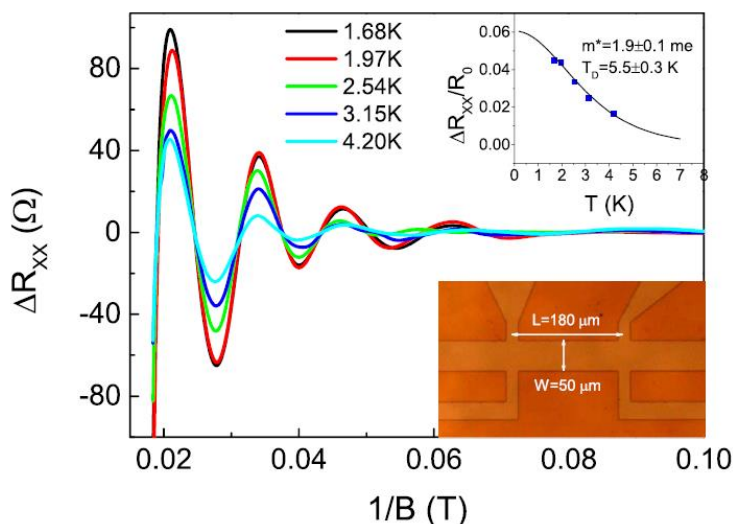
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This project aims at investigating the electronic properties of a two-dimensional electron gas at the interface between complex oxides. A decade after its seminal discovery by Ohtomo and Hwang [Nature 427, 423 (2004)] in the canonical system  $\text{LaAlO}_3/\text{SrTiO}_3$ , the origin and properties of this intriguing 2D



quantum fluid are not yet fully settled, despite the wealth of potential applications. Here, we propose to focus on an alternative system: the interface between  $(\text{LaAlO}_3)_{0.3}(\text{SrAl}_{0.5}\text{Ta}_{0.5}\text{O}_3)_{0.7}$  and  $\text{SrTiO}_3$  with much higher electronic mobility than its  $\text{LaAlO}_3/\text{SrTiO}_3$  counterpart. By combining high field / low temperature magneto-transport and high resolution electron

Temperature dependence of the Shubnikov-de Haas oscillations in  $\text{LaAlO}_3/\text{SrTiO}_3$  as a function of the inverse magnetic field. In this study, the magnetic field is as high as 60T. The insets show the oscillations' amplitude fitted using the Lifshitz-Kosevich expression and a photo of the sample under optical microscope.

microscope



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microscopy techniques, we aim at uncover the electronic properties (band-structure and spatial location of the charge carriers) in correlation with the structural properties of the interface.

We are looking for a motivated candidate with solid knowledge in condensed matter physics. An experience in cryogenics and/or electronic transport would be considered as assets. The candidate will develop and drive magneto-transport experiments under high (pulsed) magnetic field (70T) and low temperature (400mK). The successful candidate will work at the Laboratoire National des Champs Magnétiques Intenses in Toulouse, France. The samples will be provided by Prof. Ariando at the National University of Singapore Nanoscience and Nanotechnology Initiative. Please contact Prof. M. Goiran or Dr. W. Escoffier for further details.

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