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【666】 Subband structure and electron-phonon coupling in the two-dimensional electron gas at the SrTiO₃ (001) surface

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Two-dimensional electron gases (2DEGs) in SrTiO₃ arise in many configurations, of which the LaAlO₃/SrTiO₃ interface is a prominent example with remarkable properties such as gate-tunable superconductivity. I will present angle resolved photoemission spectroscopy measurements of the 2DEG induced at the (001) surface of SrTiO₃, providing insight into the subband structure that underpins all SrTiO₃ 2DEGs. I will further show that the strength and nature of electron phonon coupling in the SrTiO₃ surface 2DEG evolves as the carrier density is tuned. At low densities, comparable to those found for the LaAlO₃/SrTiO₃ system, we observe an itinerant liquid of Fröhlich polarons, which places constraints on theoretical descriptions of superconductivity in LaAlO₃/SrTiO₃.

Author: MCKEOWN WALKER, Siobhan (University of Geneva)

Co-authors: Dr WANG, Z. (Swiss Light Source, Paul Scherrer Institut); Dr TAMAI, A. (University of Geneva); Mr WANG, Y. (Stanford University); Dr BRUNO, F. Y. (University of Geneva); Dr DE LA TORRE, A. (University of Geneva); RICCO, S. (University of Geneva); Dr HOESCH, M. (Diamond Light Source); Dr KING, P. D. C. (University of St Andrews); DEVEREAUX, T. P. (Stanford University); Dr RADOVIC, M. (Paul Scherrer Institute); Prof. BAUMBERGER, F. (University of Geneva)

Presenter: MCKEOWN WALKER, Siobhan (University of Geneva)

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