凝聚态物理-北京大学论坛

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Intriguing interfaces in unconventional electron systems

Prof. Hans Hilgenkamp

Abstract： While many materials exhibit special electronic properties, resulting from the interplay between charge, spin, lattice and orbital degrees of freedom, interfaces in such materials can give rise to even further remarkable features. I will illustrate this by two examples from our own research. The first are half-integer magnetic flux quanta that appear spontaneously at the interface between high-Tc and low-Tc superconductors [1,2]. The second are conducting states between the insulators LaAlO3 and SrTiO3, which exhibit besides a high mobility conductance also magnetic effects and tunable superconductivity [3]. If time permits, I will further show some recent results on coupling superconductors with 3D-topological insulators [4] and on Scanning SQUID Magnetic Microscopy studies of complex oxide thin films. [1]: Nature 422, 50 (‘03); [2]: Science 312, 1495 (‘06); [3]:Nature Mater.6,493 (‘07); [4]:Nature Mater.11,417(‘12).

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