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Controlling transport of the SrIrO3 correlated semimetal by doping with an ionic liquid. JACOBO SANTAMARIA, Univ Complutense. Spain, J. TORNOS, Instituto de CC de Materiales. ICMM-CSIC. Spain, A. PEREZ-MUOZ, M. CABERO, F GALLEGO, A. RIVERA, Z. SEFRIOUI, M. VARELA, C. LEON, Univ Complutense, J. GARCIA BARRIOCANAL, Univ. of Minnesota, F. MOMPEAN, M. GARCIA-HERNANDEZ, ICMM-CSIC — The interplay between Mott and spin orbit physics in 5d oxides may result from the splitting of crystal field states by the strong spin orbit interaction. Among them, $SrIrO_3$ is a correlated semimetal, with a groundstate which has been proposed to be topologically protected by the crystalline symmetry. The strong coupling of the electronic structure to oxygen rotations and its interplay with spin orbit interaction gives rise to anomalously narrow bands. The semimetallic state results from the compensation of electron and hole carriers (pockets) coming from separated regions in momentum space. This explains how epitaxial strain enhances the asymmetry of electron hole mobilities eventually triggering a metal to insulator transition (MIT). An intriguing question is the correlated nature of this MIT, and if as such, it can be controlled by charge density. To address this question we have conducted doping experiments with ionic liquid gating. In this talk we will show that the strain induced MIT can be in fact controlled by doping indicating the role played by electron correlations in the semimetallic state of SrIrO3.

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