

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Ionic Liquid Gating of SrTiO₃ Nanowires¹ TERENCE BRETZ-SULLIVAN, ALLEN GOLDMAN, Univ of Minn - Minneapolis — In recent years, ionic liquid (IL) field effect gating of complex oxides has revealed novel electronic phases in electronic density regimes not easily attainable by chemical doping or by solid gate dielectric field effect tuning. Specifically, ionic liquid gated Strontium Titanate (STO) serves as an ideal system to study due to its relevance to the LaAlO₃/SrTiO₃ hetero-interface. Nevertheless, IL gating of nanoscale regions of STO has not been extensively explored. In this talk, the results of IL gated nanowires of STO will be discussed. Nanowires, patterned by electron beam lithography, are defined by a narrow channel of width 100nm in the resist PMMA on top of single crystal STO substrates. The IL is confined to this channel and thus by applying a gate voltage will accumulate electrons at the IL/STO interface, i.e. at the channel floor, by the formation on an electric double layer. Non-linear current-voltage characteristics have been observed using a two-terminal geometry over a set of gate voltages and a temperature range of 2K-35K. These characteristics exhibit behavior similar to Coulomb Blockade physics; however, the possibility of other phenomena has not been ruled out.

¹Supported in part by the US Department of Energy Basic Energy Sciences under Grant No. DE-FG02-02ER4600. Samples were fabricated in the Nano Fabrication Center, which receives funding from the NSF as part of NINN.

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Date submitted: 15 Nov 2013

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