Abstract Submitted
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**Nanomechanical probes of sketched $LaAlO_3/SrTiO_3$ single-electron transistors**[1] JESSICA MONTONE, FENG BI, MENGCHEN HUANG, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh, HYUNGWOO LEE, CHANG-BEOM EOM, University of Wisconsin-Madison — The interface of $LaAlO_3/SrTiO_3$ presents a locally tunable metal-insulator transition that can be utilized to create complex nanostructures. Using conducting AFM lithography techniques, we can create a variety of nanoscale devices such as sketched single-electron transistors (SketchSETs)[2]. Due to the piezoelectric properties of $LaAlO_3/SrTiO_3$, there exists the possibility of locally modulating the local electron density using the pressure applied by an AFM tip. Some of the most interesting properties are only observed at cryogenic temperature. For this purpose we utilize a cryogenic AFM system. I will describe our efforts to perform nanomechanical imaging of conductive structures, which can be helpful in mapping the electronic properties of oxide nanostructures.

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[2]G. Cheng, *et. al*, Nature Nanotechnology **6**, 343 (2011).

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