Abstract Submitted
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**Experimental quantum simulation using 1D $LaAlO_3/SrTiO_3$ nanostructures**[1] MEGAN KIRKENDALL, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh, SANGWOO RYU, CHANG-BEOM EOM, University of Wisconsin-Madison — Quantum simulation of important Hamiltonians could lead to new insights into quantum matter, for example, high-temperature superconductors. The 2DEG at the $LaAlO_3/SrTiO_3$ interface[2] exhibits a wide variety of phenomena including a tunable metal-insulator transition, magnetism, strong spin-orbit coupling, and superconductivity. These properties can be controlled at extreme nanoscale dimensions using a conductive-AFM writing technique[3]. Here we describe experiments in which 1D lattice structures are created at the $LaAlO_3/SrTiO_3$ interface and investigated using low temperature magnetotransport. These devices will allow us to modify the effective interactions between Cooper pairs and quasiparticles in the superconducting lattice, and represent an early demonstration of the potential of this solid-state quantum simulation platform.

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