## Abstract Submitted for the MAR10 Meeting of The American Physical Society

Fabrication and

Characterization of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> and La<sub>0.67</sub>Ca<sub>0.33</sub>MnO<sub>3</sub> Nanostructures<sup>1</sup> YI-TANG YEN, JOHN Y.T. WEI, Department of Physics, University of Toronto and Canadian Institute for Advanced Research, PAI-CHIA KUO, JESSIE SHIUE, MAW-KUEN WU, Institute of Physics, Academia Sinica, Taiwan — We present a novel technique to fabricate nanostructures of superconducting YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> and ferromagnetic La<sub>0.67</sub>Ca<sub>0.33</sub>MnO<sub>3</sub>. The nanostructures are in the form of Aharonov-Bohm rings and ultralong wires with very high aspect ratios, intended to study quantum interference phenomena at mesoscopic length scales in these materials. The fabrication involves deep nano-patterning of SrTiO<sub>3</sub> substrates using focused ion beam (FIB) and epitaxial thin-film growth using pulsed laser-ablated deposition (PLD). The samples are characterized by electrical transport measurements under cryomagnetic conditions, and various high-resolution microscopies including AFM, SEM, TEM, and STM. Our fabrication technique combining FIB and PLD provides a reliable general method for nano-structuring complex oxide materials.

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