

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Coupling between oxygen octahedron rotations, Jahn-Teller distortion, magnetic ordering and epitaxial strain in LaMnO<sub>3</sub> from first principles** JUN HEE LEE, KARIN M. RABE, Rutgers University, KRIS DELANEY, ERIC BOUSQUET, NICOLA SPALDIN, University of California Santa Barbara — LaMnO<sub>3</sub> is known to have rich physics due to coupling among orbital ordering, Jahn-Teller distortions and magnetism. However, less attention has been paid to the role of oxygen octahedron rotations and epitaxial strain. In this talk, we show from first principles calculations that oxygen octahedron rotations induce weak ferromagnetism in *Pbnm* LaMnO<sub>3</sub> and that octahedral rotations are cooperatively coupled to the Jahn-Teller distortion.. Furthermore, we predict that compressive epitaxial strain drives bulk *A*-type antiferromagnetic *Pbnm* insulating phase to a ferromagnetic metallic phase. At the phase boundary between the ferromagnetic-metallic and antiferromagnetic-insulating phases, colossal magneto-resistance is expected.

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Date submitted: 20 Nov 2010

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