

Abstract Submitted  
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**Magnetism of LaAlO<sub>3</sub>/SrTiO<sub>3</sub> Heterostructure Interface** LU LI<sup>1</sup>,  
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partment of Physics, Massachusetts Institute of Technology — The LaAlO<sub>3</sub>/SrTiO<sub>3</sub>  
heterostructure is a potential candidate for a high mobility two-dimensional elec-  
tron system with novel electronic and magnetic properties. Magnetic ordering has  
been proposed to arise from d-shell electrons transferred by the polarization discon-  
tinuity at the interface. However the magnetization of this system cannot easily  
be detected with standard techniques due to the small volume of the interfacial  
region. Using torque magnetometry, we measure the magnetic moment of the in-  
terface system directly. Our results indicate the existence of a magnetic ordering  
at the two-dimensional conductive interface. The ferromagnetic-like ordering state  
persists up to 200 K. Such a state is hardly explained by ion-exchange at the in-  
terface, since LaTiO<sub>3</sub> is antiferromagnetic. Moreover, the same magnetic behavior  
persists even when the sample is superconducting, which suggests an unconventional  
two-dimensional superconducting phase.

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