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Abstract for an Invited Paper
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**Chiral magnetism at oxide interfaces**[1]

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There are tantalizing hints of magnetism at the n-type $LaAlO_3/SrTiO_3$ interface, but the experimental evidence remains controversial in view of some of the differences between different samples and probes. I will argue that if magnetism exists at interfaces, symmetry arguments imply chiral interactions [1] that lead to a spiral ground state in zero external field and skyrmion crystals for $H \neq 0$. I will next present a microscopic model that provides a possible mechanism for the formation of local moments. I will show that the coupling of these moments to itinerant electrons leads to ferromagnetic double exchange together with Dzyaloshinskii-Moriya (DM) interactions and an easy-plane "compass" anisotropy, which arise from Rashba spin-orbit coupling (SOC) due to the lack of inversion symmetry at the interface. The compass term, often ignored in the literature on chiral magnetism, is shown to play a crucial role in determining the magnetic ground state. I will compare our results with existing torque magnetometry data on LAO/STO and try to reconcile it with scanning SQUID magnetometry. Finally, I will present the phase diagram in a field and show that easy-plane anisotropy stabilizes an unexpectedly large skyrmion crystal phase and describe its properties. (Work done in collaboration with Sumilan Banerjee, Onur Erten, Daniel Kestner and James Rowland).

[1] S. Banerjee, O. Erten and M. Randeria, Nature Physics 9, 626 (2013).

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