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Emergent conductance and magnetism at metal oxide interfaces via internal charge transfer[1] HANGHUI CHEN, ANDREW MILLIS, CHRIS MARIANETTI, Columbia Univ — Internal charge transfer across the interface of transition metal oxides is proven to be a powerful approach to induce new electronic structure in metamaterials (PRL 111, 116403 (2013); arXiv:1408.0217 (2014)). Here we use ab initio calculations to demonstrate that while $SrVO_3$ is a paramagnetic metal and $SrMnO_3$ is an antiferromagetic insulator, charge transfer in a $SrVO_3/SrMnO_3$ superlattice leads to both electronic and magnetic reconstructions on the Mn sites: the Mn e_g states are electron doped and the Mn t_{2g} core spins are ferromagnetically aligned. As a result, net magnetic moments are expected to emerge in the superlattice. Our work shows that charge transfer is a robust route to the design of novel two dimensional half metallic ferromagnets.

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