Abstract Submitted
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Strain-modulated asymmetric orbital–lattice interactions in correlated oxide heterostructures[1] J. CHAKHALIAN, Univeristy of Arkansas, J. RONDINELLI , JIAN LIU, B. GRAY, M. KAREEV, E.J. MOON, J. COHN, M. VARELA, S.G. ALTENDORF, F. STRIGARI, B. DABROWSKI, L.H. TJENG, P.J. RYAN, J.W. FREELAND — Artificial structuring of quasi-two dimensional correlated electron thin films and heterointerfaces offers an arena to discover innovative functionalities by harnessing electronic and orbital degrees of freedom. To harness this potential understanding of how structurally linked correlated electronic responses are modified through epitaxial constraints at the substrate–film heterointerface is clearly required. We use a suite of advanced experimental probes along with ab-initio calculations to show how compressive and tensile bi-axial strain lead to unusual asymmetrical orbital responses. Microscopic studies based on resonant X-ray spectroscopies reveal that the asymmetry leads to a new ground state with a ligand hole density and chemical bond covalency that is modulated by the sign of the epitaxial constraint at the interface.

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