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Magnetic Origin of the Tetragonal-Orthorhombic Phase Transition in the Cuprates JIANGPING HU, Purdue University, CHEN FANG, STEVEN KIVELSON, Stanford University, STUART BROWN, UCLA — It is shown that a quasi two dimensional (layered) Heisenberg antiferromagnet with fully frustrated interplane couplings generically exhibits two thermal phase transitions with lowering temperature – an upper transition ("order from disorder without order") in which the lattice point-group symmetry is spontaneously broken, and a lower Neel transition at which spin-rotational symmetry is broken. We therefore suggest that it may primarily be the magnetic interactions between planes, rather than strains associated with a mismatch of ionic radii, that are responsible for the tetragonal to orthorhombic (T-O) structural phase transition seen in many of the cuprates.

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