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Noncoplanar magnetism in the Hubbard model on frustrated lattices SANJEEV KUMAR, KANIKA PASRIJA, Indian Institute of Science Education and Research (IISER) Mohali — Ferromagnets and staggered antiferromagnets are the most common forms of magnetic orderings that one comes across in models and materials. However, during the last few years non-collinear and non-coplanar magnetic states have been of special interest for condensed matter researchers due to their relevance to a variety of phenomena, such as, ferroelectricity, anomalous Hall effect, etc. A number of theoretical studies have shown that such magnetic states exist in Kondo-lattice model at special band-fillings on various geometrically frustrated lattices. It was recently shown that the Kondo-lattice model on a checkerboard lattice supports non-coplanar magnetic states which lead to a topologically non-trivial band gap in the electronic spectrum (PRL 109, 166405(2012)). We begin by asking if such magnetic ground-states can also be realized in a Hubbard model which, unlike the Kondo-lattice model, does not contain "pre-formed" localized magnetic moments. We make use of a mean-field decoupling scheme which allows for non-collinear and non-coplanar magnetic states in the Hubbard model. We show that the triangular lattice and the checkerboard lattice do support non-coplanar magnetic phases similar to the ones found in a Kondo-lattice model.

Sanjeev Kumar
Indian Institute of Science Education and Research (IISER) Mohali

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