

Abstract Submitted
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Ferromagnetism in flat bands and Pauli-correlated percolation MYKOLA MAKSYMENKO, Max-Planck-Institut für Physik Komplexer Systeme, Dresden, Germany, ANDREAS HONECKER, Georg-August-Universität Göttingen, Göttingen, Germany, RODERICH MOESSNER, Max-Planck-Institut für Physik Komplexer Systeme, Dresden, Germany, JOHANNES RICHTER, Universität Magdeburg, Magdeburg, Germany, OLEG DERZHKO, Institute for Condensed Matter Physics of NAS of Ukraine, KIRILL SHTENGEL, University of California at Riverside — Flat-band ferromagnetism is an exotic case of itinerant-electron magnetism in a wide class of geometrically frustrated lattices. We develop an exact mapping between the ground state of the many-body problem and a novel site-percolation problem. This allows us to study the ferromagnetic transition using tools from equilibrium statistical physics. In the case of Hubbard model on the Tasaki lattice, we provide a complete and exact solution in 1D and show that for $D > 1$, the paramagnetic phase persists beyond the uncorrelated percolation point, with a transition in the form of a first-order jump to an unsaturated ferromagnetic phase.

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