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**Critical phenomena of emergent monopoles in a chiral magnet**

XIAO-XIAO ZHANG, Univ. of Tokyo, NAOTO NAGAOSA, Univ. of Tokyo and RIKEN CEMS — A three-dimensional cubic Skyrmion crystal in the bulk, which is simultaneously a lattice of monopole-antimonopole pairs predicted theoretically, has been recently identified experimentally in MnGe. Adopting appropriate temperature Green's function technique for optical conductivity and devising a solvable phonon-magnon interaction, we systematically developed the theory of coupling spin-waves to both itinerant electrons and mechanical degrees of freedom in this chiral magnet, describing the latest experimental observations including anomalies and critical phenomena in magnetotransport and magnetoelasticity, which are identified as hallmarks of fluctuations of the emergent monopolar fields upon the nontrivial monopole dynamics and especially a topological phase transition signifying strong correlation. As a whole, they speak for a crucial role played by the monopole defects and hence the real-space spin topology in this material.

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