

Multiple magnetic phases and topological transport properties in chiral magnets

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Various topological magnetic structures have been identified in a prototypical skyrmionic bulk material, so-called B20-type compounds. The wide solid-solution range in this material system allows the engineering of multiple parameters, such as DM interaction, magnetic anisotropy and electronic structure, leading to the discovery of multiple magnetic phases with different topology, dimensionality and modulation period (Figure).

In this talk, we would like to show our recent results on formations of topological magnetic structures and consequent emergent phenomena in bulks and films of B20-type compounds. In particular, we introduce various large transport properties, such as topological Hall and thermoelectric effects, which may originate from the effective monopole field of spin hedgehogs. This work is done in collaboration with K. Akiba, T. Arima, R. Arita, S. Awaji, C. D. Dewhurst, Y. Fujishiro, M. Ichikawa, K. Ishizaka, H. Ishizuka, F. Kagawa, K. Kakurai, Y. Kawamura, M. Kawasaki, A. Kikkawa, S. Kimura, K. Kindo, T. Koretsune, A. Kitaori, Y. Kozuka, R. Kurihara, A. Matsuo, H. Mitamura, A. Miyake, D. Morikawa, T. Nakajima, A. Nakamura, N. Nagaosa, K. Ohishi, H. M. Rønnow, K. Shibata, T. Shimojima, J. Shiogai, Y. Taguchi, M. Tokunaga, Y. Tokura, A. Tsukazaki, V. Ukleev, J. S. White, X. Z. Yu

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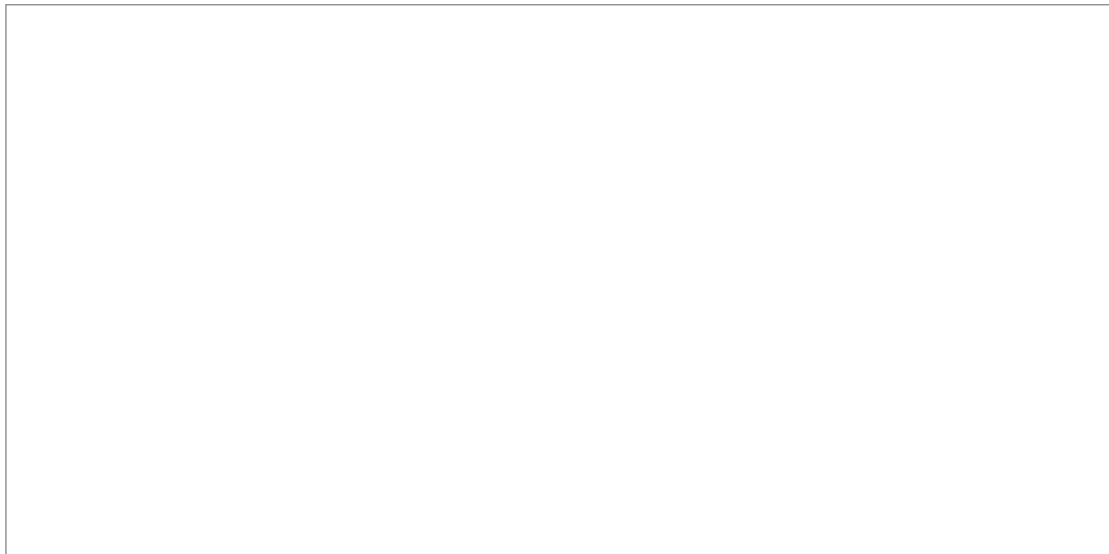


FIG: Multiple topological magnetic phases in B20-type chiral magnets. Reproduced from [1].
[1] Y. Fujishiro, N. Kanazawa and Y. Tokura, to be published from APL Perspectives.