MAR16-2015-000872

Skyrmions in frustrated magnets[1]

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A skyrmion in magnets or magnetic skyrmion is a stable spin texture with nontrivial topology and behaves like a particle at mesoscale. To stabilize a skyrmion, it is required to have a characteristic length scale, which can be introduced by competing interactions. Recently skyrmion lattice has been observed experimentally in chiral magnets without inversion symmetry, where the skyrmions are stabilized by the competition between the exchange and Dzyaloshinskii-Moriya interactions. The skyrmions in chiral magnets have been studied actively and have been demonstrated to be promising for applications. These skyrmions share qualitatively similar properties in metals, semiconductors and insulators and can be described by a simple universal Hamiltonian. Skyrmions can also be stabilized in frustrated magnets with inversion symmetry. In the talk, we will present a general Ginzburg-Landau theory for the skyrmions in the frustrated magnets. We will discuss their unusual properties in comparison to those in chiral magnets. Finally we will also discuss the conditions for the stabilization of skyrmions.