

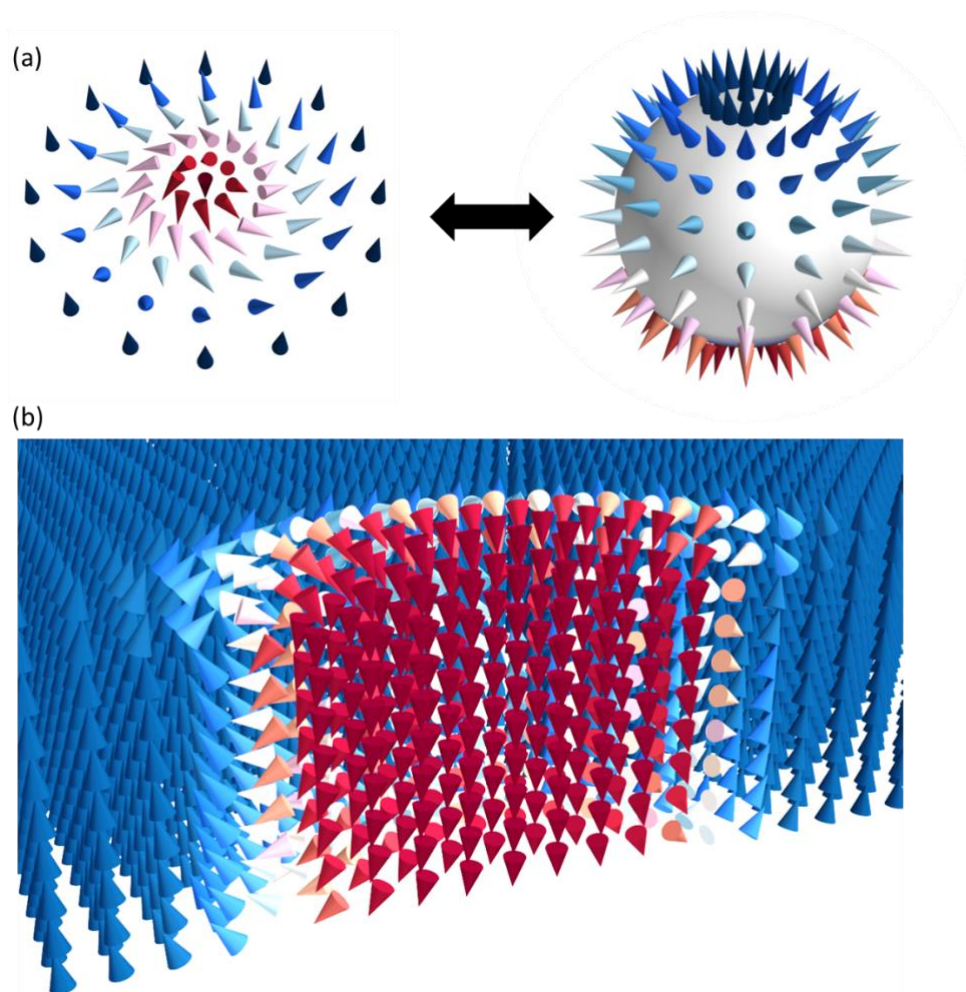
Skyrmions

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Magnetic skyrmions are magnetic solitons, with a spin texture topologically different from the uniform ferromagnetic state, holding a lot of promise for applications as well as of fundamental interest. They have been observed for the first time in magnetic multilayers at room temperature only a few years ago. The topology of these magnetic objects imposes peculiar dynamics, interesting both in fundamental and applied perspectives.

After a general introduction (definition, general properties), we will explore skyrmions in more details for the case of metallic multilayers based on the Co|Pt interface. We will discuss in particular the experiments of electrical nucleation, propagation, and detection. These are essential steps for devices, but they also enlighten several fundamental aspects. We will in particular discuss the three-dimensional magnetic textures of the skyrmions in magnetic multilayers, differing for the naive two-dimensional picture, with important implications for their manipulation.



Magnetic Skyrmions. (a) The skyrmions have a peculiar topology: their spins cover the 4π direction of space and turn with a given chirality. (b) Skyrmions in multilayers can have more complex textures with hybrid chirality, as illustrated by this cross-section.