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Topological Spin Textures in Confined Geometries¹

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The magnetic skyrmion is a nanostructured spin texture stabilized by the spin-orbital coupling. Its nontrivial topology enables unique dynamical property and thermal stability, which give out promise on future magnetic memory device. However, to enable its applications, it is essential to understand the skyrmion properties in confined geometries and tackle key challenges including the creation and detection of skyrmions, preferably without magnetic fields. In this talk, I will present our recent theory-experiment collaboration results, covering studies of skyrmions in nanoribbon, nanodisk, and nanowires. Zero field skyrmions and their polarization switch will be discussed. New skyrmion materials and new topological textures in helimagnet heterostructures will be presented.

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