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Skyrmion oscillations in chiral cylindrical nanowires MICHALIS CHARILAOU, JOERG LOEFFLER, ETH - Zurich — The occurrence of skyrmions on surfaces due to the competition of symmetric and antisymmetric interactions is a fascinating phenomenon with a promising potential for new technologies. The spatial confinement of spin textures in nanostructures, such as thin films, and the breaking of symmetry by an external or internal field enable the formation of skyrmions and skyrmion lattices. In cylindrical nanowires, the spatial confinement and the symmetry-breaking field are provided by the solid itself due to magnetostatics, i.e., shape anisotropy. Based on high-resolution micromagnetic simulations we will show that in cylindrical nanowires of FeGe non-trivial skyrmionic spin textures occur, which resemble a skyrmion chain. These break the translational symmetry along the wire via an oscillation of the topological charge. We will also discuss how external fields can manipulate the skyrmion-chain state and how magnetization switching occurs via the formation of Bloch points.

Michalis Charilaou
ETH - Zurich

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