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Functional Spintronic Nanomaterials for Radiation Detection and Energy Harvesting



From curvilinear magnetism to shapeable magnetoelectronics

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Extending 2D structures into 3D space has become a general trend in multiple disciplines, including electronics, photonics, plasmonics, superconductivity and magnetism [1,2]. This approach provides means to modify conventional or to launch novel functionalities by tailoring curvature and 3D shape of magnetic thin films and nanowires [2,3]. In this talk, we will address fundamentals of curvature-induced effects in magnetism and review current application scenarios. In particular, we will demonstrate that curvature allows tailoring fundamental anisotropic and chiral magnetic interactions [4] and enables fundamentally new non-local chiral symmetry breaking effect [5,6]. Application potential of geometrically curved magnetic architectures is currently being explored as mechanically reshapeable magnetic field sensors for automotive applications, memory, spin-wave filters, high-speed racetrack memory devices as well as on-skin interactive electronics relying on thin films [7,8] as well as printed magnetic composites [9] with appealing self-healing performance [10].

Reference list

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