

## Skyrmions in magnetic multilayers: materials physics and device applications

Wanjuan Jiang

Department of Physics and State Key Laboratory of Low-Dimensional Quantum Physics,  
Tsinghua University, China, 100084

\* Jiang\_lab@tsinghua.edu.cn

Magnetic skyrmions are topological spin textures that exhibit many exciting properties [1-3]. In this talk, I will first review our experimental results in the electric creation and manipulation of magnetic skyrmions at room temperature in a Ta/CoFeB/TaO<sub>x</sub> trilayer with an interfacial inversion symmetry breaking, which was enabled by the inhomogeneous current induced spin-orbit torques [4-6]. Secondly, I will demonstrate experimentally a real space spin-topology driven dynamics of magnetic skyrmion – the skyrmion Hall effect [7-8]. Namely, an accumulation of skyrmions at the transverse side of the device is experimentally achieved. Thirdly, Brownian motion of a single magnetic skyrmion driven by the random thermal fluctuations will be both numerically and experimentally investigated. Finally, some thoughts on the device application of magnetic skyrmion will be discussed.

### References:

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