

Seminar: Hard Condensed Matter Theory

Room: Galilei Raum, 01-128 (Staudinger Weg 9)

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Impact of the chemical nature of defects on the pinning of magnetic skyrmions

Owing to their topology, magnetic skyrmions are considered as potential particles for future information technology. However, incorporation of magnetic skyrmions as information carriers or memory storage units in future information technology nodes requires a detailed understanding of the impact of device imperfections on their speed, motion, creation and stability. Following our previous studies [1, 2], I will discuss first-time fully ab-initio based simulations of single magnetic skyrmions in Pd/Fe/Ir(111) surface interacting with 3d and 4d impurities and investigate the impact on the energetics, electronic and magnetic properties. With a careful analysis of the hybridization of the electronic states, the important mechanisms behind the expulsion or pinning of single magnetic skyrmions as function of the chemical nature of the impurities are identified. I will highlight the universality of the skyrmions energy landscape when interacting with transition metal defects and the possible impact on skyrmions motion.

[1] D. Crum, *et al.* Nature Commun. 6, 8541 (2015).

[2] M. Dos Santos Dias, *et al.* Nature Commun. 7, 13613 (2016).

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All interested are cordially welcome!