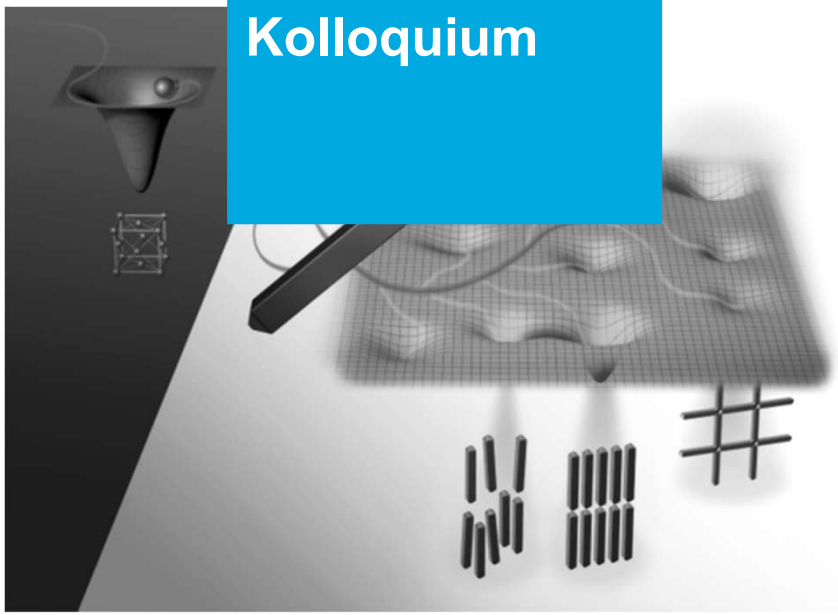
Universität Konstanz

# SFB1214 Kolloquium



## Tuning magnetic anisotropy in nanostructures for biomedical and electromagnetic applications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Host: Ulrich Nowak


**Monday, 29.04.2019, 13:30**
**Room: P 603**


Magnetic nanoparticles have been building blocks in applications ranging from high density recording to spintronics and] nanomedicine. Magnetic anisotropies in nanoparticles arising from surfaces, shapes and interfaces in hybrid structures are important in determining the functional response in various applications. In this talk I will first introduce the basic aspects of anisotropy and discuss resonant RF transverse susceptibility, that we have used extensively, as a powerful method to probe the effective anisotropy in magnetic materials. Tuning anisotropy has a direct impact on the performance of functional magnetic nanoparticles in biomedical applications such as contrast enhancement in MRI and magnetic hyperthermia cancer therapy. I will focus on the role of tuning surface and interfacial anisotropy with a goal to enhance specific absorption rate (SAR) or heating efficiency. Strategies going beyond simple spherical structures such as exchange coupled core-shell nanoparticles, nanowire, nanotube geometries can be exploited to increase heating efficiency in magnetic hyperthermia. In addition to biomedical applications, composites of anisotropic nanoparticles dispersed in polymers pave the way to a range of electrically and magnetically tunable materials for RF and microwave device applications. This lecture will combine insights into fundamental physics of magnetic nanostructures along with recent research advances in their application in nanomedicine and electromagnetic devices.


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