

PHYSIKALISCHES KOLLOQUIUM

Mittwoch, 05.12.2012, um 17:15 Uhr

Ort: Reichenhainer Str. 90; Neues Hörsaalgebäude, Raum: 2/N013



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Magnetic nanoparticles: fundamentals and application

A promising approach for a future diagnosis of, e.g., virus diseases is the application of magnetoresistive sensors in lab-on-a-chip structures. This enables the production of cheap, portable, easy-to-use and fast devices for the standard human diagnosis. Such biosensors are based on two recently developed techniques and devices: Magnetic nanoparticles and XMR-sensors, where XMR means either giant magnetoresistance (GMR) or tunnelling magnetoresistance (TMR).

Our contribution is focused on chemical and physical aspects so as to synthesis magnetic nanoparticles and on physical aspects which play an important role realizing lab-on-a-chip structures. Firstly we will report on the synthesis of magnetic nanoparticles. Secondly, we will cover the development of highly sensitive GMR- and TMR-sensors based on a nanoparticulate or multilayered nature so as to enable an optimized magnetic interactions with these magnetic nanoparticles.

Furthermore, the concept of magnetic nanoparticles as reconfigurable matter will be discussed. Under the influence of homogeneous, rotating magnetic fields, superparamagnetic beads or nanoparticles can be assembled into one- and two-dimensional superstructures on demand so as to be used as dynamic components in microfluidic devices or as printable magnetoresistive sensors when embedded in conductive matrices.

Alle Zuhörer sind ab 17:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.