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**Andreas Hütten***Bielefeld University, Germany***Magnetic nanoparticles meet microfluidics**

Lab-on-a-chip immunoassays utilizing super paramagnetic beads as labels allow for transport, separation and detection of different bead species by employing magnetic strayfield landscapes and/or special channel geometries in microfluidic systems in combination with integrated magnetoresistive sensors. Moreover, the formation of magnetic bead superstructures due to dipolar magnetic interactions can be applied as configurable matter so as to realize programmable microfluidic functions such as mixers, filters or valves which are able to simultaneously detect biomolecule via molecular recognition. This lecture is focused on physical aspects regarding microfluidics and the formation of magnetic bead superstructures which play an important role on the way to magnetically controlled lab-on-a-chip structures. Moreover, the realization of giant magnetoresistive sensors based on these magnetic bead super structures will be discussed in detail.

Biography

Andreas Hütten has completed his PhD in Physics from Göttingen University in Germany and was working as a Feodor Lynen Research Fellow at UC Berkeley and Lawrence Berkeley National Laboratory in the US and in Germany at the Leibnitz Institute for Solid State and Materials Research Dresden. He is Professor of Thin Films and Physics of Nanostructures at the Department of Physics at Bielefeld University in Germany. He has published more than 190 papers in reputed journals and is serving as an Editorial Board Member for sensors.

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