UNIVERSITÄT DUISBURG ESSEN

Physikalisches Kolloquium

(Festkolloquium anläßlich der Emeritierung von Professor Dr. Wolfgang Kleemann)

Mittwoch, 31.10.07
17.15 Uhr
Hörsaal MC 122

Magnetoresistive devices: from data storage to new biomedical applications

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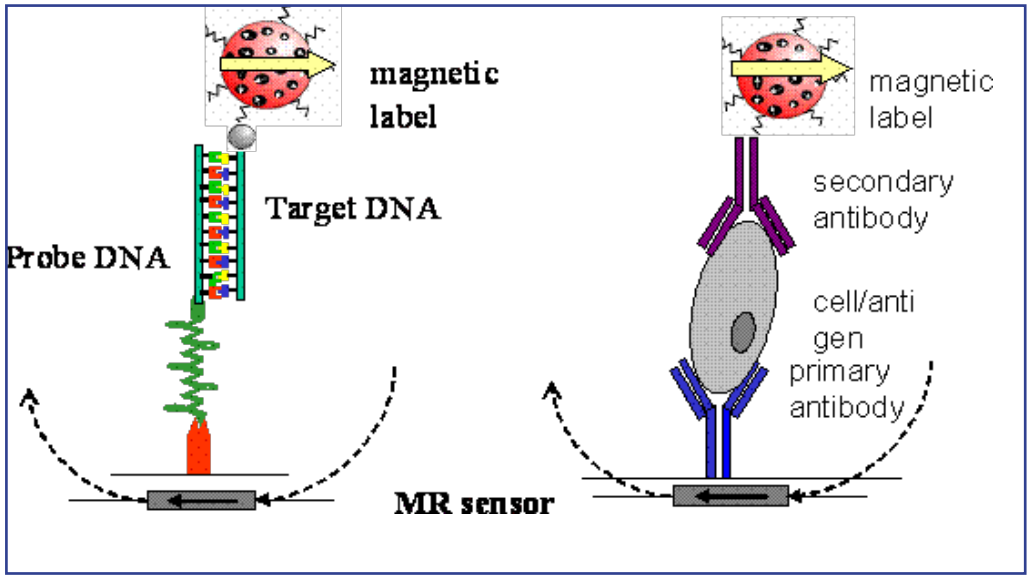

Magnetoresistive thin film sensors are presented (spin valves or magnetic tunnel junction devices), and their application discussed in existing products (hard disk read heads and magnetoresistive random access memories) and in new emerging biomedical applications. The device multilayer stack is optimized to produce either maximum TMR, field sensitivity and SNR, or optimized switching characteristics at the required operational frequency. For biomedical applications, field sensitivity is being pushed below 1pT/sqrt(Hz) to allow for imaging applications (magneto-cardiography) in hybrid devices incorporating flux guides and a magnetoresistive element. For biochip applications, small magnetoresistive sensors are being used to detect biomolecular recognition events, where target biomolecules are labeled with nanometer sized or micron sized magnetic particles. These can be used in point of care diagnostic platforms, with single molecule detection capability.