

**FAKULTÄT für PHYSIK  
LUDWIG-MAXIMILIANS-UNIVERSITÄT  
MÜNCHEN/GARCHING**

**PHYSIK-DEPARTMENT  
TECHNISCHE UNIVERSITÄT MÜNCHEN  
MÜNCHEN/GARCHING**

## **MLL-KOLLOQUIUM**

**Donnerstag, 03.11.2011, 16<sup>15</sup> Uhr**

Hörsaal der LMU in Garching, Am Coulombwall 1  
Treffen zum gemeinsamen Kaffee 16 Uhr

**Prof. Axel Haase**

**Zentralinstitut für Medizintechnik (IMETUM), TU München**

**Worried about the poor sensitivity of NMR?**

**New technologies promise a bright future for biomedical imaging**

The low energy of nuclear magnetic resonance transition provides no side effects in biomedical applications but results in a fundamentally low signal-to-noise ratio. The poor sensitivity of NMR becomes even worse when high spatial or time resolution is required. In addition, NMR gives access to biochemical information, but for the in vivo measurement of crucial metabolites having low concentration, the signal cannot reach the detection threshold. A few technological advances in magnetic resonance promise a dramatically increased sensitivity and therefore the hope for new areas of applications in life sciences. The following advances will be discussed in the lecture: (i) higher magnetic field strength, (ii) cold NMR coils, (iii) phased-array coils and parallel NMR imaging, (iv) hyperpolarization of selected metabolites. In all cases where NMR has still fundamental barriers, other imaging modalities might help. Recently combined multimodal imaging systems have been developed (e.g. MRI-PET) with excellent new possibilities.

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