



Sonderforschungsbereich 631
Festkörperbasierte Quanteninformationsverarbeitung



SEMINARANKÜNDIGUNG

Dienstag, 25. Mai 2010

17:15 Uhr

WSI, Seminarraum S 101

“Controlling single spins in diamond”

Owing to their remarkable stability, colour centers in diamond have already found an application in quantum cryptography. In this talk I will discuss recent progress regarding spin-based quantum information processing and atomic magnetometry. In particular, it is possible to place single impurity atoms into isotopically modified diamond with high degree of control. We demonstrate the generation and precise tomography of bi- and tripartite nuclear and electron nuclear spin entanglement, for the first time in solid state system. It proves that the quality of entanglement is excellent fostering their potential use in quantum applications like quantum teleportation protocols. We show that scalable quantum logic elements can be realized by exploring long range magnetic dipolar coupling between individually addressable single electron spins. Furthermore, we experimentally demonstrate an ideal quantum non-demolition measurement of the nitrogen nuclear spin associated with nitrogen-vacancy centre.

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