



Seminarankündigung

Dienstag, 12. Mai 2015

13:00 Uhr

WSI, Seminarraum S 101

“Dynamics of single spins in diamonds”

Color centers in diamond show remarkable physical properties making them good candidates for quantum bits, single photon sources and precise magnetic field sensors with a nanometer spectral resolution. These defects can be measured at the single site level even at room temperature, allowing to perform a variety of fundamental experiments.

In first part of the talk the recent progress in the fabrication of nitrogen-vacancy (NV) centers in diamond will be presented. By using chemical vapor deposition (CVD) we managed to grow ultra pure diamond layers, where the coherence time of NVs limited only by the presence of residual ^{13}C nuclear spins (1 % natural abundance). By introducing nitrogen gas into the CVD growth chamber we can position NVs 5 nm close to the diamond surface. Interestingly the shallow NVs are not observable unless the surface is treated with oxygen or fluorine plasma.

In the second part of the talk the latest experiments in coherent control of NVs will be shown. These include:

- Detection of few metallo proteins using NVs centers in nanodiamonds.
- Control of a single quantum system the rotating wave approximation is not valid.
- Detection of a single nuclear spin on the diamond surface.
- Accelerated 2D NMR spectroscopy using matrix completion.

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