Sonderforschungsbereich 631

Festkörperbasierte Quanteninformationsverarbeitung

im Oktober 2005

SEMINARANKÜNDIGUNG

Freitag, 14. Oktober 2005, 11.00 Uhr

Max-Planck-Institut für Quantenoptik

Großer Hörsaal

Cavity-QED with Single Electron Spins

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A single electron trapped in a quantum dot is a promising semiconductor-based system to study various quantum optical effects taking the electron spin as the quantum bit candidate. While the optical transitions occur on nanosecond scale, decoherence times for an electron spin are predicted to be about 10^6 times longer. I will present recent progress as well as challenges towards all-optical spin read-out. I will further discuss a technique for deterministically coupling a single quantum dot to a photonic crystal nanocavity, which, in turn, will allow for quantum information processing using quantum dot spins and cavity QED.