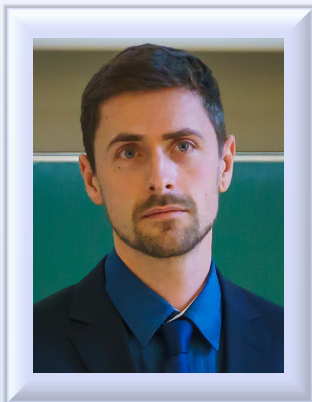
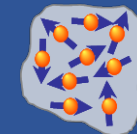


Leipzig Spin Resonance Colloquium

July 7th, 2021 – 16:00 Leipzig time – on Zoom



Dr. Ralf Wunderlich
Felix Bloch Institute, Leipzig, Germany



The Nitrogen Vacancy Center in Diamond as Source for Nuclear Hyperpolarization

Nuclear magnetic resonance (NMR) is a powerful method with high spectral resolution and is therefore widely used in physics and chemistry, for example in the structural analysis of molecules. Furthermore, magnetic resonance imaging (MRI) is a crucial tool in modern medical diagnostics today. The signal intensity in these applications is largely determined by the polarization of the spins involved, i.e. by the different occupation of the spin energy levels. In thermal equilibrium, the occupation of the energy levels is described by the Boltzmann distribution. Since the energy levels are energetically close to each other, there is only a small difference in the population at room temperature and thus only a weak signal intensity. For example, ^{13}C spins ($I=1/2$) in a magnetic field of 7 T at room temperature yield only a polarization of $\sim 10^{-5}$. In order to improve the NMR signal intensity it is usually tried to increase the polarization by low temperatures or high magnetic fields.

In recent years, the idea of employing negatively charged nitrogen vacancy (NV) centers ($S=1$) in diamond as polarization agents for nuclear spins is attracting increasing interest because its electron spin can be almost completely polarized by illumination with green light. The talk will cover an introduction to the outstanding properties of NV centers, their generation, and finally their application in NMR as polarization source.

July 7th, 2021 - 16:00 CEST (Berlin) - 22:00 CST (Peking) - 07:00 PST (San Francisco) - 10:00 EST (New York)

Zoom: <https://uni-leipzig.zoom.us/my/lsrcolloquium>

For Zoom passcode register at: <https://bloch.physgeo.uni-leipzig.de/amr/lsrcolloquium>