5	**Lars Liebermeister**	Single Photon Source with a Diamond Nanocrystal on an Optical Nanofiber	The development of high yield single photon sources is crucial for applications in quantum information science as well as for experiments on the foundations of quantum physics. The NV-center in diamond is a promising solid state candidate. By using nanodiamonds the single photon emission can easily be coupled to integrated nano-optical and plasmonic structures. Our approach is to utilize efficient coupling of fluorescence of a single NV-center to the evanescent field of an optical nanofiber [1]. A hybrid microscope (confocal microscope combined with an AFM) allows to optically characterize and preselect diamond nanocrystals and then to apply an AFM nanomanipulation technique to move a selected nanodiamond deterministically onto the tapered optical fiber. We report on first results with single diamond nanocrystals containing several NV-centers positioned on a tapered optical fiber. We observe fluorescence emission in the guided mode of the fiber. The second order correlation recorded between the free-space and the guided fluorescence shows pronounced antibunching. This demonstrates efficient evanescent coupling with low background. [1] Kien et al., Phys. Rev. A 72(3), (2005)
6	**Norikazu Mizuochi**	Single photon, spin, and charge manipulation of diamond quantum register	Single-photon sources that provide non-classical light states on demand have a broad range of application in quantum communication, quantum computing, and metrology. Recently, significant progresses have been shown in semiconductor quantum-dots. However, a major obstacle is the requirement of cryogenic temperatures. Here we show the realization of a stable room temperature electrically driven single-photon source based on a single NV centre in a diode structure.
7	**Dr. Georgy Astakhov**, University of Würzburg, Germany	Multi-quantum spin resonances of intrinsic defects in silicon carbide	We report the observation of multi-quantum microwave absorption and emission, induced by the optical excitation of silicon vacancy related defects in silicon carbide (SiC). In particular, we observed two-quantum transitions from +3/2 to -1/2 and from -3/2 to +1/2 spin sublevels, unambiguously indicating the spin S=3/2 ground state. Our findings may have implications for a broad range of quantum applications. On one hand, a single silicon vacancy defect is a potential source of indistinguishable microwave photon pairs due to the two-quantum emission process. On the other hand, the two-quantum absorption can be used to generate a population inversion, which is a prerequisite to fabricate solid-state maser and quantum microwave amplifier. This opens a new platform to perform cavity quantum electrodynamics experiments and quantum information processing on a single chip.
8	**Prof. Jeronimo Maze**, Pontificia Universidad Catolica de Chile	Theoretical description for artificial atoms in diamond and the effect of nuclear spin bath on their coherence time	Trapped molecules or defects in solids can be accessed with high level of control and enable applications such as biological signal sensing, quantum information processing and single photon sources. In order to successfully implement these applications it is crucial to have a detailed knowledge of the structure and dynamics of the defect's quantum electronic and nuclear degrees of freedom as well as its interaction with the environment. During this talk we present recent progress on understanding the structure and dynamics of the silicon-vacancy (SiV) centre in diamond based on group theoretical arguments. We model the magnetic field dependence of the SiV spectrum at cold temperatures and its polarization properties finding good agreement with experimental results. In addition, we study the free induction decay of the electronic spin associated with the nitrogen-vacancy centre in high-purity diamond samples where the main source of decoherence is the hyperfine interaction with a bath composed of ^{13}C nuclear spins [1]. We observe an increment of the coherence time by a universal factor of sqrt(5/2) as the magnetic field is increased along the symmetry axes of the defect. We also discuss how the random angular position of nuclei relative to the magnetic field and symmetry axes of the defect accounts for the statistical variance in the coherence time enhancement factor. [1] *Free Induction Decay of Spins in Diamond* , J. R. Maze, A. Dréau, V. Waselowski, H. Duarte, J.-F. Roch, and V. Jacques, New J. Phys. 14, 103041 (2012).