13	**Prof. Ferdinand Schmidt-Kaler,** University of Mainz, Germany	Quantum technologies for solid state physics using cold trapped ions	The quantum states of ions are perfectly controlled, and may be used for fundamental research in quantum physics, as highlighted by the Nobel Prize given to Dave Wineland in 2012. Two directions of quantum technologies, followed by the Mainz group, have high impact on solid state physics: I) The delivery of single cold ions on demand for the deterministic doping of solid state materials with nm spatial precision to generate design-structures optimized for quantum processors. II) The simulation of solid state relevant Hamiltonians with AMO systems of one or two dimensional arrays of trapped ions. I will talk about the recent progress in both fields. http://www.quantenbit.de/#/publications/
14	**Miss Yiwen Chu,** Harvard University, USA	Nanophotonic quantum interface for nitrogen vacancy centers in diamond	Nitrogen vacancy (NV) centers in diamond have emerged as a promising solid-state platform for quantum communication, quantum information processing and nanoscale sensing with optical read-out. Engineering light-matter interactions is crucial for the practical realization of these systems. I will present our work toward realizing individual NV centers embedded in nanofabricated hybrid photonic crystal cavities consisting of single crystal diamond and PMMA based Bragg structures. Devices with quality factors up to 3,000 coupled to NV centers have been implemented, leading to substantial Purcell enhancement of zero-phonon line. We investigate the optical coherence properties of NV centers inside these nanoscale structures and report on first cavity QED experiments with such systems. Applications of diamond nanophotonic devices for quantum networks and nonlinear optics with single photons will be discussed.
16	**Prof. Jörg Schmiedmayer,** VCQ, Atominstitut, Vienna, Austria	Connecting Photons to Spins	I will discuss two examples of connecting optical and micro wave photons to spins in diamond and compare their advantages and disadvantages: micro wave photons connected to spin ensembles in solids (NV centers) and optical photons to single NV centers in micro cavities. NV-Photon interface: Scalable Quantum network – I will present a scheme to build a photonic quantum information module based on a three-level Λ system embedded in a fiber connected optical cavity, and our progress towards implementing it with NV centers. Interfacing superconducting circuits to spin ensembles: The coupling between the MW photon and the magnetic moment of the spins is significantly enhanced by using a superconducting coplanar waveguide resonator (CPWR), where the small mode volume In experiment we demonstrate strong coupling of an ensemble of NV centres to a superconducting transmission line resonator