Symposium Strong Coupling in Solid State Quantum Systems (SYSC)

jointly organized by the divisions
the Low Temperature Physics (TT),
the Dynamics and Statistical Physics (DY),
the Semiconductor Physics (HL), and
the Magnetism (MA)

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Like two atoms coupling to a molecule, solid state-based quantum systems can be designed to couple, forming artificial, hybrid superposition states. If the coupling rate exceeds the loss rates of the two (originally isolated) quantum systems, the so-called strong coupling limit is reached. In this regime, a coherent exchange of excitations between the two quantum systems becomes possible, which in particular enables quantum information conversion.

The symposium shall give an overview over the current state of the art in solid-state based strong coupling approaches, aiming to unravel the advantages and the challenges of the different experimental realization schemes, and to highlight future developments.

Overview of Invited Talks and Sessions

(Lecture Room H1)

Invited Talks

SYSC 1.1	Tue	9:30–10:00	H1	**Exploring the Physics of Superconducting Qubits Strongly Coupled to Microwave Frequency Photons** — •Andreas Wallraff
SYSC 1.2	Tue	10:00–10:30	H1	**Hybrid Quantum Circuit with a Superconducting Qubit Coupled to an Electron Spin Ensemble** — •Yuimaru Kubo, Cecile Grezes, Igor Diniz, Jun-ichi Isoya, Vincent Jacques, Anais Dreau, Jean-François Roch, Alexia Auffeves, Denis Vion, Daniel Esteve, Patrice Bertet
SYSC 1.3	Tue	10:30–11:00	H1	**Hybrid Quantum Systems with Rare-Earth Ion Spin Ensemble** — •Pavel Bushev
SYSC 1.4	Tue	11:00–11:30	H1	**Quantum Coherent Coupling between a Mechanical Oscillator and an Optical Mode** — Ewold Verhagen, Dalziel Wilson, Vivishek Sudhir, Nicolas Piro, Albert Schliesser, •Tobias Kippenberg
SYSC 1.5	Tue	11:30–12:00	H1	**Exploring Quantum Light-Matter Interactions of Quantum Dots in Photonic Crystal Nanostructures** — •Jonathan Finley, Arne Laucht, Michael Kaniber, Stefan Lichtmannecker, Thorsten Reichert, Guenther Reithmaier, Fabrice Laussy, Ulrich Hoheneester

Sessions

SYSC 1.1–1.5	Tue	9:30–12:00	H1	**Strong Coupling in Solid State Quantum Systems (SYSC)**