TECHNISCHE UNIVERSITÄT WIEN

INSTITUT FÜR FESTKÖRPERPHYSIK
Institute of Solid State Physics

Wiedner Hauptstr. 8-10/138, 1040 Wien
www.ifp.tuwien.ac.at

EINLADUNG zum IFP-SEMINAR

Driven dissipative microwave circuits: phase transitions, non-reciprocity and entanglement

Johannes Fink

Institute of Science and Technology Austria, Am Campus 1, 3400 Klosterneuburg, Austria

Host:	Silke Bühler-Paschen
Termin:	Mittwoch, 8. Mai 2019, 16:00 Uhr
Ort:	Institut für Festkörperphysik, TU Wien
	Wiedner Hauptstraße 8-10, 1040 Wien
	Seminarraum DC rot 07 (roter Bereich, 7. OG)

Abstract:

We will present recent experiments that all rely on strong driving fields and controlled dissipation in engineered mesoscopic microwave circuits. In the first example we show how a microscopic system - a single superconducting qubit coupled to a single microwave resonator - exhibits a quantum phase transition between two classical states i.e. reflective (empty resonator) and transparent (loaded resonator). We will show preliminary results that support the view that a thermodynamic limit with stable phases can be approached by increasing the ratio between coupling and dissipation rates. The second set of experiments demonstrates how the interplay between parametric driving, interference and dissipation in a multi-mode cavity electromechanical system can either break time reversal symmetry and act as a compact on-chip microwave circulator, or deterministically entangle microwave signals. Observation of stationary entanglement not only reveals the quantum nature of the mechanical oscillator mediating the interaction without measuring it directly, it also represents an important resource for quantum communication and quantum enhanced sensing.