GOETHE
UNIVERSITÄT
FRANKFURT AM MAIN

Fachbereich Physik
Institut für Theoretische Physik

CONDENSED MATTER THEORY SEMINAR

Subject: **Quantum Geometry of Josephson Matter**

Speaker: **Prof. Dr. Wolfgang Belzig, Universität Konstanz**

Date & time: **Friday, January 18th, 2019 at 3.15 p.m.**

Venue: **Seminar room 1.114**

Topology is providing new insight into condensed matter physics problems. Concepts like Chern numbers and their relation to physical phenomena have become very familiar, but actually, key quantities like the quantum geometric tensor, which provides a much deeper information about quantum states, remain experimentally difficult to access. Recently it has been shown that multiterminal superconducting junctions constitute an ideal playground to mimic topological systems in a controlled manner. Here, we theoretically study the spectrum of Andreev bound states in topological Josephson matter and demonstrate that the full information of the quantum geometric tensor of the ground state manifold can be extracted with the help of microwave spectroscopy. In particular, we develop the concept of artificially polarized microwaves, which can be used to obtain both the quantum metric tensor and the Berry curvature. The quantized integrated absorption provides a direct evidence of topological quantum properties of the Andreev states.

Authors: Raffael Klees, Gianluca Rastelli, Juan Carlos Cuevas and Wolfgang Belzig "Microwave spectroscopy reveals the quantum geometric tensor of topological Josephson matter" http://arxiv.org/abs/1810.11277v1