TECHNISCHE UNIVERSITÄT DRESDEN

Bereich Mathematik und Naturwissenschaften Fakultät Physik

DRESDNER PROMOTIONSPREIS PHYSIK 2020

Program:

- Opening: Dean of the Faculty of Physics, Prof. Dr. Michael Kobel
- Welcoming Address: Vice-Rector for Research, Prof. Dr. Angela Rösen-Wolff
- Laudations: Chair of the Prize Committee, Prof. Dr. Jan Budich
- Laureate Lectures: Dr. Ruben Verresen and Dr. Urban Seifert

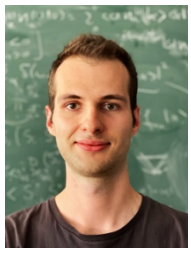
Time and Place: Tuesday, 5.1.2021, 16:40 // Virtual prize ceremony in **BigBlueButton**
Teilnehmende mit ZIH-Login:
https://selfservice.zih.tu-dresden.de/l/link.php?m=64178&p=f43a9b28
Teilnehmende ohne Hochschullogin:
https://selfservice.zih.tu-dresden.de/link.php?m=64178&p=2d0d7b7d

Lectures:

Dr. Ruben Verresen: Schrödinger's Phoenix

A quantum system can occupy multiple states at once. In particular, an unstable particle can be in a quantum superposition with its decay product---used by Schrödinger in his famous thought experiment of a cat suspended between life and death. In this talk, we identify a new surprising feature: increasing the likelihood of particle decay can, paradoxically, prevent and even undo its disintegration. More figuratively, Schrödinger's cat can resurrect like a phoenix from the ashes. We show how this phenomenon of avoided decay gives new insights into many-body quantum systems, since their low-temperature properties are largely determined by the (in)stability of emergent quasiparticles. Due to recent advances in experimental techniques and tensor network simulations, this novel phenomenon can be observed in quantum materials.

Dr. Urban Seifert: Interplay of a quantum spin liquid and a metal: Fractionalized Fermi liquids and exotic superconductivity



Quantum spin liquids are fascinating states of magnetic matter which evade a description in terms of symmetry-breaking order, and are rather characterized by their entanglement structure which can support fractionalized quasiparticles. With candidate materials at hand, recent experimental developments suggest the possibility of designing heterostructures in which these couple to additional degrees of freedom. A key question then pertains to novel phases stabilized in these systems. In this spirit, I will consider the Kitaev Kondo lattice, where conduction electrons are coupled to local moments which form Kitaev's exactly solvable model of a quantum spin liquid. At small Kondo couplings we find a fractionalized Fermi liquid (FL*), a stable metallic state outside the Fermi-liquid paradigm. At the transition between FL* and a conventional Fermi liquid a superconducting phase occurs which inherits its nematic triplet pairing structure from the spin liquid.

Gefördert von:
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DRESDEN concept
Exzellenz aus Wissenschaft und Kultur