TT 20 Schottky Award Lecture

Zeit: Montag 12:30–13:15 Raum: TU P270

Hauptvortrag TT 20.1 Mo 12:30 TU P270

Quantum Correlations in Mesoscopic Systems — •Wolfgang Belzig — Department of Physics and Astronomy, University of Basel, Klingelbergstr. 82, 4056 Basel, Schweiz

Full counting statistics aims at a complete characterization of the distribution of measurement outcomes. In my talk I will demonstrate how this concept allows to investigate quantum correlations in a variety of mesoscopic systems. Three examples will be discussed:

a) In analogy to Schottky's work on the current fluctuations in a vacuum diode, shot noise in superconducting contacts allows to identify the nature of the elementary charge transfer events.

b) The Coulomb interaction in complex quantum dots or molecules leads to a strongly correlated current statistics.

c) The density fluctuation statistics in a fermionic quantum gas reflects the crossover from a superfluid state to a molecular Bose-Einstein condensate.