

Theoriekolloquium

Am **25. Januar 2018** um **14.15 Uhr** in **W2 1-143** hält

Herr Prof. Dr. Michael Fleischhauer (Kaiserslautern)

einen Vortrag mit dem Titel

Topological phases of mixed states and their detection

Topological states of matter have fascinated physicists since a long time due to the exotic properties of elementary excitations and the topological protection of edge states and currents. The notion of topology is usually associated with ground states of (many-body)-Hamiltonians. So what is left of it at finite temperatures? Moreover, can topological protection be extended to systems with losses? Motivated by topological charge pumps, first introduced by Thouless, I will discuss a classification for topological phases of matter applicable to finite-temperature states as well as stationary states of driven, dissipative systems based on the many-body polarization. In contrast to charge transport, the polarization can be used to probe topological properties of non-interacting and interacting closed and open systems alike and remains a meaningful quantity at finite T . For non-interacting fermions it defines a topological invariant, the *ensemble topological phase* (ETP). I discuss the physical significance of the ETP and specific examples such as a Thouless pump in the steady state of one-dimensional lattices driven by Markovian reservoirs and the finite-temperature Rice-Mele and Harper-Hofstadter models.

Interessierte sind herzlich eingeladen.

gez. Prof. Dr. Martin Holthaus