

## THEORETISCH PHYSIKALISCHES KOLLOQUIUM

**Donnerstag, den 04.07.2019 um 15:30 Uhr in Raum 46-576**

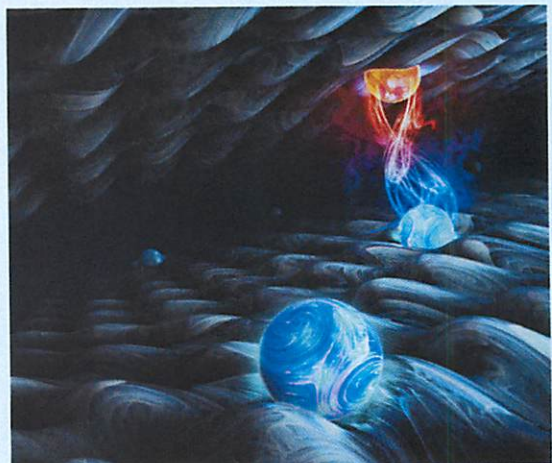
**Measuring quantum geometry in synthetic matter:  
From NV center spins to fractional Chern insulators**

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The intimate connection between geometry, topology, and quantum physics has been widely explored in solid-state physics, revealing a plethora of remarkable physical phenomena over the years. Building on their universal nature, topological properties are currently studied in an even broader context, ranging from ultracold atomic gases to photonics, where distinct observables and probes offer a novel view on topological quantum matter.

In this talk, I will discuss how the geometry of quantum states can be revealed using a universal scheme based on spectroscopic responses. When applied to Chern insulators or Landau levels, this approach leads to a quantized circular dichroism phenomenon, which can be interpreted as the dissipative counterpart of the quantum Hall effect. I will report on the first experimental observation of quantized circular dichroism in an ultracold Fermi gas, and discuss possible generalizations to strongly-correlated states of matter. In particular, I will show how the many-body Chern number of a fractional Chern insulator can be extracted from excitation-rate measurements. Finally, I will present a protocol allowing for the experimental detection of the quantum metric tensor, which was recently implemented in NV center spins in diamond.



Gäste sind herzlich willkommen.

Die Dozenten der Theoretischen Physik