UNIVERSITÄT LEIPZIG

Fakultät für Physik und Geowissenschaften
Institut für Theoretische Physik

STP-Seminar

Am Donnerstag, **23.05.2019**, **15.00 Uhr**

spricht

Dr. Simone Barbarino

TU Dresden

über

First order topological phase transitions and fractional topological phases in 1d strongly correlated fermionic ladders

Topological insulators are unconventional states of matter characterized by a topological invariant and separated from trivial gapped phases by topological quantum phase transitions. For non-interacting fermions, topological insulators are fully classified in terms of the Altland-Zirnbauer classification and topological quantum phase transitions are accompanied by the closing of the band gap. In the presence of particle-particle interactions, these two paradigms are strongly altered. During my talk I will focus on the role of particle-particle interactions in one-dimensional topological insulators. I will discuss an example of a first-order topological quantum phase transition in a strongly correlated four-leg ladder which supports a symmetry protected topological phase in the presence of an on-site repulsive interaction [1]. Then, I will show that a hierarchy of purely interacting symmetry protected topological phases can emerge at fractional filling fractions in one-dimensional interacting ladders whose single-particle band structure describes a topological insulator [2, 3].

References
[1] S. Barbarino, G. Sangiovanni, and J. C. Budich, Phys. Rev. B 99 075158 (2019)
[2] S. Barbarino, L. Taddia, D. Rossini, L. Mazza, and R. Fazio, Nat. Comm. 6 8134 (2015)
[3] S. Barbarino, D. Rossini, M. Rizzi, G. E. Santoro, R. Fazio, and M. Dalmonte, New J. Phys. 21 043048 (2019)

Ort: ITP, Raum 211

Interessenten sind herzlich eingeladen!

gez. Prof. Rosenow