凝縮系物理学ゼミナール

日時：7月 7日 （水）13：30～

場所：理学部5号館　413号室

講演者: Ms. Simone Hamerla 氏

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JSPS Summer Program participant)**

「From the derivation of t-J models at finite doping to interaction quenches of Fermi systems」

The first part of my talk deals with the Hubbard model. Due to the complexity of the model we do not aim at solving it but rather at simplifying it by eliminating charge fluctuations. This elimination is performed by the use of self-similar continuous unitary transformations (sCUT). Thus an effective model is derived whose structure is imposed by the chosen generator. The effective model is a generalized t-J model which also captures interactions and dynamics of charges. Starting from a doped Hubbard model the doping dependence of the effective coupling constants is derived. The mapping relies on the energetic separation of sectors with different numbers of double occupancies. Calculating this separation the range of applicability is calculated in dependence on the doping constant.

In the second part of the talk I will consider interaction quenches of Fermi systems. Due to the great advances in the controllability of experimental parameters in optical lattices, the evolution of Fermi systems following a sudden change of the system 's parameters can be studied. Using a higher-order equation of motion approach based on the Heisenberg equation the real-time evolution of the momentum distribution can be calculated for Hubbard models and spinless fermions.