

CONDENSED MATTER THEORY SEMINAR

Subject: **Spin and Mass Imbalance in Extended Hubbard Model**

Speaker: **Dr. Arya Dhar (Goethe-Universität Frankfurt)**

Date & time: **Friday, November 11th, 2016 at 3:15 p.m.**

Venue: **Seminar room 1.114**

We study the interplay between population imbalance in a two-component fermionic system and nearest-neighbor interaction in one dimension using matrix product states method. Our analysis reveals a new parameter regime for the existence of the Fulde-Ferrell-Larkin-Ovchinnikov phase. Furthermore, we find distinct evidence for the presence of hidden order in the system. We present an effective model to understand the emergent oscillations in the string correlations due to the imbalance, and show how they can become an efficient tool to investigate systems with imbalance. We also extend our analysis to include mass imbalance in the above system and study its effects on different phases. We look for the emergence of trimers and clusters by generalizing the definition of the trimer gap.