Student Seminar
Summer Term 2015
Freiburg, April 8–10, 2015

SFB/Transregio 49
Frankfurt – Kaiserslautern - Mainz
Condensed matter systems with variable many-body interactions

Wednesday, April 8

Until 12:30	Arrival at venue
12:30-13:30	*Lunch*
13:30-13:50	Dmytro Bozhko (Kaiserslautern):
	Full electric detection of a Bose-Einstein condensate via the spin-pumping effect
13:50-14:10	Tobias Lausch (Kaiserslautern):
	Evolutionary optimization techniques applied to a Bose gas experiment
14:10-14:30	Dominik Linzner (Kaiserslautern):
	Bistability in a dissipative Rydberg lattice model
14:30-14:50	Denis Morath (Kaiserslautern):
	1D Fermions in a harmonic trap with spin-imbalanced filling
14:50-15:10	Axel Pelster (Kaiserslautern):
	Tunable anisotropic superfluidity in optical Kagome superlattice
15:10-15:30	Dominik Straßel (Kaiserslautern):
	Magneto-caloric effects, quantum critical points, and the Berezinsky-Kosterlitz-Thouless transition in 2D coupled spin dimer systems
15:30-16:00	*Coffee Break*
16:00-16:20	Alisah Chernenkaya (Mainz):
	Nature of the empty electronic states of TCNQ and their thermal evolution due to the CDW instability of TTF-TCNQ revealed by NEXAFS
16:20-16:40	Elena Gati (Frankfurt):
	Mott criticality in organic charge transfer salts
16:40-17:00	Antonia Morherr (Frankfurt):
	New charge transfer systems based on polycyclic aromatic hydrocarbons
17:00-17:20	Pascal Puphal (Frankfurt):
	Stabilisation of the tetragonal structure in $Ba_xSr_{1-x}CuSi_2O_6$
17:20-17:40	Simon Streib (Frankfurt):
	Hard-core boson approach to spin-1/2 triangular-lattice antiferromagnets near the quantum critical point
18:00-19:00	*Dinner*
19:00-22:00	**Poster Session (see Appendix)**

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Thursday, April 9

08:00-09:00	*Breakfast*
09:00-09:45	Shijie Hu (Kaiserslautern):
	Density-matrix renormalization group method: Success in 1D
09:45-10:00	Discussion
10:00-10:45	Francesc Salvat-Pujol (Frankfurt):
	Preliminaries for a density-functional-theory description of the many-particle problem
10:45-11:00	Discussion
11:00-11:30	*Coffee Break*
11:30-12:15	Pramod Kumar (Frankfurt):
	Dynamical mean-field theory for correlated fermions and bosons I
12:15-12:30	Discussion
12:30-13:30	*Lunch*
13:30-18:00	**Hiking**
18:00-19:00	*Dinner*
19:00-21:00	Tanja Hagedorn (Frankfurt):
	Funding options for PhD students and postdocs

Friday, April 10

08:00-09:00	*Breakfast*
09:00-09:45	Denis Morath (Kaiserslautern):
	Monte Carlo Simulation I - From the basic ideas to the Metropolis algorithm and Quantum Monte Carlo
09:45-10:00	Discussion
10:00-10:45	Dominik Straßel (Kaiserslautern):
	Monte Carlo Simulation II - Overview of Quantum Monte Carlo algorithms: Their different advantages and fields of application
10:45-11:00	Discussion
11:00-11:30	*Coffee Break*
11:30-12:15	Shijie Hu (Kaiserslautern):
	Density-matrix renormalization group method: Challenge in 2D
12:15-12.30	Discussion
12:30-13:30	*Lunch*

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13:30-14:15	Francesc Salvat-Pujol (Frankfurt):
	Density functional theory on the augmented plane wave basis - An ab-initio calculation ab origine
14:15-14:30	Discussion
14:30-15:15	Pramod Kumar (Frankfurt):
	Dynamical mean-field theory for correlated fermions and bosons II
15:15-15:30	*Discussion*
15:30-16:00	*Coffee Break*
16:00-	Departure

Poster Session:

Michaela Altmeyer (Frankfurt): *Electronic structure of three polymorphs of the charge transfer salt $(BEDT\text{-}TTF)_2Ag(CF_3)_4(TCE)$*

Martin Bonkhoff (Kaiserslautern): *Driven Bose-Hubbard model with impurity*

Benjamin Gänger (Kaiserslautern): *Towards a BEC-BCS transition with impurities*

Benedikt Hartmann (Frankfurt): *Mott metal-insulator transition induced by utilizing a glass-like structural ordering in low-dimensional molecular conductors*

Ryui Kaneko (Frankfurt): *Spontaneous symmetry breaking in variational wave functions: When is it possible?*

Lukas Keller and Markus Zörb (Frankfurt): *Thin film investigations on ferroelectric organic charge transfer systems*

Farina Kindermann (Kaiserslautern): *Dynamics of single atoms in a bath*

Matthias Moos (Kaiserslautern): *Two-photon bound states of Rydberg polaritons*

Jan Phieler (Kaiserslautern): *Towards impurities in an ultracold Fermi gas*

Lars Postulka (Frankfurt): *Field-induced ordered phases in coupled spin-dimer systems*

Kira Riedl (Frankfurt): *Dzyaloshinskii-Moriya interaction in frustrated systems*

Dandan Su (Frankfurt): *Interacting bosons in an optical cavity*

David Zielke (Frankfurt): *Statistical properties of the charge-carrier dynamics at the Mott critical endpoint in κ-$(BEDT\text{-}TTF)_2X$-salts*