

Programme on
**“Synergies between Mathematical and Computational Approaches
to Quantum Many-Body Physics”**

August 29 – October 21, 2016

organized by

**Ali Alvai (U Cambridge & MPI Solid State Research, Stuttgart), Sabine Andergassen
(U Tübingen), Manfred Salmhofer (U Heidelberg), Alessandro Toschi (TU Vienna)**

Workshop

October 3 – 7, 2016

• **Monday, October 3, 2016**

09:00 – 09:30 **Opening & Registration**

09:30 – 10:15 **Christoph Kopper**

Bounds and Convergence statements deduced from Flow Equations

10:15 – 11:00 **Christian Lubich**

Dynamical low-rank approximation

11:00 – 11:45 *coffee / tea break*

11:45 – 12:30 **Tilman Enss**

Fermi polarons and the ferromagnetic instability

12:30 – 15:00 *lunch break*

15:00 – 15:45 **Giulio Schober**

Functional renormalization and mean-field approach to multiband systems with spin-orbit coupling: Application to the Rashba model with attractive interaction

15:45 – 16:30 **Stefan Kehrein**

Flow Equation Holography

• **Tuesday, October 4, 2016**

09:30 – 10:15 **Edwin Langmann**

Non-equilibrium physics and transport in a quenched Luttinger liquid

10:15 – 11:00 **Laszlo Erdős**

The matrix Dyson equation in random matrix theory

11:00 – 11:45 *coffee / tea break*

11:45 – 12:30 **Jonas Lampart**

Can quantum dynamics be described by the density only?

12:30 – 15:00 *lunch break*

15:00 – 15:45 **Andreas Grüneis**
Reducing finite size errors in correlated many-electron theory calculations of solids

15:45 – 16:30 **George Booth**
Sampling wavefunctions in the thermodynamic limit

• **Wednesday, October 5,, 2016**

09:00 – 09:45 **Robert Seiringer**
Decay of correlations and absence of superfluidity in the disordered Tonks-Girardeau gas

09:45 – 10:30 **Jakob Yngvason**
2D electrostatics and incompressibility of quantum fluids

10:30 – 11:15 *coffee / tea break*

11:15 – 12:00 **Andreas Eberlein**
Transport at the Ising-nematic quantum critical point in two-dimensional metals

12:00 – 12:45 **Pawel Jakubczyk**
Amplitude Fluctuations in the Berezinskii-Kosterlitz-Thouless phase

12:45 – 15:00 *lunch break*

15:00 – 15:45 **Ulisse Stefanelli**
Stable carbon configurations

19:30 **Dinner at Heurigen**

• **Thursday, October 6, 2016**

09:30 – 10:15 **Mathieu Lewin**
Lieb-Oxford inequality, Jellium and the Uniform Electron Gas

10:15 – 11:00 **Jean-Bernard Bru**
Universal Bounds for Large Determinants from Non-Commutative Hölder Inequalities in Fermionic Constructive Quantum Field Theory

11:00 – 11:45 *coffee / tea break*

11:45 – 12:30 **Jens Eisert**
Tensor network states as tools for mathematical and computational approaches to quantum many-body physics

12:30 – 15:00 *lunch break*

15:00 – 15:45 **Jan von Delft**
Nonequilibrium steady-state transport through quantum impurity models - a hybrid NRG-DMRG treatment

15:45 – 16:30 **Frithjof Anders**
A chemically driven quantum phase transition in a two-molecule Kondo system: Combining density functional theory with the numerical renormalization group

- **Friday, October 7, 2016**

09:30 – 10:15 **Alessandro Toschi**

Quantum field theory at the two-particle level: Challenges and perspectives

10:15 – 11:00 **Micheal Potthoff**

Nonequilibrium self-energy-functional theory

11:00 – 11:45 *coffee / tea break*

11:45 – 12:30 **Giorgio Sangiovanni**

Breakdown of dressed perturbation theory and divergencies of the irreducible vertex in many-electron systems

12:30 – 14:30 *lunch break*

14:30 – 15:15 **Jan Tomczak**

Space-time separation of electronic correlations

15:15 – 16:00 **Maurits Haverkort**

The importance of electronic entanglement and multiplets in the dynamics of quantum materials and an efficient method to study them

All talks take place at the ESI, Boltzmann Lecture Hall!