TRR80 – Young Researcher Forum

Date: **July 31st; 10:30**
Venue: **Augsburg University**

Second meeting for bringing physics back together

This is the second of two Young Researcher Forum (YRF) of the TRR80 Integrated Graduate School (IGS) in the summer term 2014. The YRF is supposed to bring together PhD and master students of participating TRR80 projects to stimulate further cooperation between young scientists and to bridge the gap between theoretical and experimental physicists within the IGS.

Program

Welcome Coffee

11:00 **Making the most out of the Integrated Graduate School**
Ioannis Stasinopoulos (TUM), (15' + 5')

Overview of the possibilities within the IGS of the TRR80 for PhD and master students.

11:20 **Magnetic phase transition of Mn/Ag(111)**
Jingfan Ye (TUM), (35' + 5')

We investigate the ground state of Mn islands on Ag(111) with a spin-polarized scanning tunneling microscope. By a variation of the island size we observe a magnetic phase transition which we attribute to a quantum phase transition, in which the anisotropy barrier between the classical ground states is lowered with decreasing island size and increasing magnetic field.

Lunch
(Pizza, ca. 12:00)

Organizers: **Georg Benka (georg.benka@frm2.tum.de)**
Patrick Seiler (patrick.seiler@physik.uni-augsburg.de)
Ioannis Stasinopoulos (I.stasinopoulos@ph.tum.de)
Sebastian Tölle (sebastian.toelle@physik.uni-augsburg.de)

Mini-Workshops

ca. 13:00

Dynamical Mean-Field Theory (Group A)

Wilhelm Appelt, Markus Greger
(Augsburg University)

In this workshop we give a brief introduction to dynamical mean-field theory (DMFT). We focus on the practical aspects of DMFT by letting the participants study the Metal to Insulator transition in the Hubbard model. The self-consistent procedure of DMFT seems at first sight to be similar to other types of mean-field approaches but is in fact very different as it is necessary to solve a full (dynamical) many body problem. The latter is feasible by Quantum Monte Carlo techniques.

Density Functional Theory

Andreas Prinz-Zwick (Augsburg University)

In this workshop we will endeavor to present an easy-to-understand, yet still mathematically correct introduction to Density Functional Theory, where the Hohenberg-Kohn Theorem is proved in detail and where we present a straight-forward way from the basics of calculus of variations down to the Kohn-Sham equations and the self consistent loop, crucial to DFT.

ca. 14:30

Dynamical Mean-Field Theory (Group B)

Wilhelm Appelt, Markus Greger
(Augsburg University)

In this workshop we give a brief introduction to dynamical mean-field theory (DMFT). We focus on the practical aspects of DMFT by letting the participants study the Metal to Insulator transition in the Hubbard model. The self-consistent procedure of DMFT seems at first sight to be similar to other types of mean-field approaches but is in fact very different as it is necessary to solve a full (dynamical) many body problem. The latter is feasible by Quantum Monte Carlo techniques.

Cryogenics and Bulk Measurements

Felix Rucker, Jan Spallek (TUM)

This workshops aims on giving insights to different low temperature techniques and bulk measurements at very low temperatures. The concepts of He_3/He_4 dilution refrigerators and adiabatic demagnetization measurements will be discussed as well as bulk properties such as susceptibility, magnetization and Hall-Effect.

End of official part

Ca. 16:00