



# TRR 80 Sonderseminar

Am Dienstag, den 30. Oktober um 16:00 Uhr

spricht

***Prof. Dr. Markus J. Aichhorn***

**TU Graz**

über das Thema

***Strong correlations and spin-orbit coupling:  
models and materials***

Strong electron correlations appear when the kinetic energy in a system is comparable or smaller than the repulsive Coulomb interaction energies. Until a few years ago this behavior was attribute in transition metal compounds almost exclusively to materials with open 3d shells, and just a few studies on a limited amount of systems have been done outside of this play ground. Only recently, it has been noted that also systems with 4d or even 5d electronic states in the conduction bands can show very interesting and unexpected behavior. A prime example are strontium iridates and rhodates, where the first one is a spin-orbit assisted insulator, whereas the latter one stays metallic.

Motivated by these interesting materials, we will first study the interplay of spin-orbit coupling and electronic correlations on a general model level. Applying continuous time quantum Monte Carlo methods to a three band model on the Bethe lattice, we see that the importance of spin-orbit coupling for electronic correlations strongly depends on other system parameters, with the electron density the most important one.

Second, we will relate these findings to real materials. We will discuss their relevance to strontium iridates and rhodates, as well as some osmium double perovskites. We will show that spin-orbital polarisation is indeed a prime factor for the understanding of these materials' properties.

Gäste sind herzlich willkommen.

Der Vortrag findet im Seminarraum S-288, Institut für Physik,  
Universität Augsburg statt.

Gastgeber: Prof. Dr. Liviu Chioncel  
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