



# EINLADUNG zum IFP-SEMINAR

## **Itinerant Magnets and Quantum Criticality**

**Eteri Svanidze**

Max-Planck-Institut für Chemische Physik fester Stoffe  
Dresden, Deutschland

Host: Silke Bühler-Paschen  
Termin: **Montag, 13. Juni 2016, 11:00 Uhr**  
Ort: Institut für Festkörperphysik, TU Wien  
Wiedner Hauptstraße 8-10, 1040 Wien  
Seminarraum DC rot 07 (roter Bereich, 7. OG)  
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The origin of magnetism in metals has been traditionally discussed within either itinerant or local pictures. Surprisingly, there are very few known examples of materials that are close to the itinerant limit, and their properties are not universally understood. In the case of the two such examples - the itinerant ferromagnets  $ZrZn_2$  and  $Sc_3In$ , the understanding of their magnetic ground states draws on the existence of  $3d$  electrons subject to strong spin fluctuations. By comparing doping-induced quantum critical points in  $ZrZn_2$  and  $Sc_3In$ , I will show that these two seemingly analogous compounds are actually quite different. Driven by these findings, we have developed a method which was used to find itinerant magnets composed of non-magnetic constituents. I will present the discovery of the first itinerant antiferromagnetic metal with no magnetic constituents -  $TiAu$ . Antiferromagnetic ground state develops below the Neel temperature  $T_N \sim 36$  K, about an order of magnitude smaller than in Cr, rendering the spin fluctuations in  $TiAu$  more important at low temperatures. Moreover, a doping-induced quantum critical point was achieved in  $TiAu$ , providing a convenient avenue for the verification of the self-consistent theory of spin fluctuations.