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EINLADUNG zum IFP-SEMINAR

Spectroscopic studies of strongly correlated 4f-electron systems

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Host: Neven Barisic

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Ort: Institut für Festkörperphysik, TU Wien
Wiedner Hauptstraße 8-10, 1040 Wien
Seminarraum DB gelb 09 (gelber Bereich, 9. OG)

Abstract:

The 4*f* electrons are localized inside the atom due to strong Coulomb interaction, yet hybridize with the itinerant conduction electrons. As a result, various anomalous phenomena can emerge, such as valence fluctuations, unconventional superconductivity, heavy-fermion behavior, and spin/charge ordering [1]. A ground-state features of the system are characterized by the competition between Kondo interactions which quench the magnetic moments and Ruderman-Kittel-Kasuya-Yosida interactions that leads to the magnetic ordering. The magnetic properties of such systems are directly related to the valence states of rare-earth ions and can be tuned by chemical substitution and external pressure. In my talk, I will present the chemical substitution controlled physical properties of $YbNi_3X_9$ (*X*=Al, Ga) [2] and $EuTGe_3$ (*T*: transition metal) [3], and related changes in their electronic structures observed by photoelectron spectroscopy [4]. I will also present the latest result of high pressure x-ray absorption spectroscopy on $EuRhGe_3$.

References

[1] C. M. Varma, Rev. Mod. Phys. **48**, 219 (1976).
[2] T. Yamashita, *et al.,* J. Phys. Soc. Jpn. **81**, 034705 (2012).
[3] O. Bednarchuk, *et al.,* J. Alloys Comp. **622**, 432-439 (2015).
[4] Y. Utsumi, *et al.,* Phys. Rev. B **86**, 115114 (2012), and Phys. Rev. B **97**, 115155 (2018).