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EINLADUNG zum IFP-SEMINAR

Spin-orbital interplay in d^1 Mott Insulators

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Host:	Jan Kunes
Termin:	Mittwoch, 12. Dezember 2018, 16:00 Uhr
Ort:	Institut für Festkörperphysik, TU Wien
	Wiedner Hauptstraße 8-10, 1040 Wien
	Seminarraum DC rot 07 (roter Bereich, 7. OG)

Abstract:

In d^1 Mott insulators, the spin-orbit coupling (SOC) stabilizes j_{eff}=3/2 quartet of an effective total angular momentum thus allowing for the emergence of multi-orbital physics and related spin-orbital frustration. Considering molybdenum, and osmium double perovskites as examples, I discuss how resulting spin-orbital interplay can give rise to a host of novel quantum phases that includes multipolar order, non-collinear spin patterns, and nonmagnetic disordered valence bond states [1]. Finally, I present an example of the honeycomb lattice d^1 compound, such as zirconium trichloride, in which, paradoxically, the strong SOC enhances the symmetry of spin-orbital space to emergent SU(4) symmetric couplings [2] that in turn may lead to a spin-orbital liquid state.

References

[1] J. Romhányi, L. Balents, & G. Jackeli, Phys. Rev. Lett. **118**, 217202 (2017)
[2] M.G. Yamada, M. Oshikawa, & G. Jackeli, Phys. Rev. Lett. **121**, 097201 (2018)