



Arnold Sommerfeld Lecture Series

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Condensed Matter Seminar:

Shining Light on Transition Metal Oxides: Resilient Quasiparticles and the Unveiling of the Hidden Fermi Liquid

Strongly correlated metals exhibit anomalous transport properties which have puzzled condensed matter physicists for many years. They are characterized by large resistivities which exceed the Mott Ioffe Reggel limit and large thermoelectric responses, which cannot be explained in terms of standard Fermi liquid quasiparticles.

Dynamical Mean Field Theory (DMFT) calculations [1,2] carried out on a doped one band Hubbard model suggest that this behavior originates in the strong temperature dependence of these parameters of the underlying resilient (non-Landau) quasiparticles.

We will test these ideas by analyzing low energy optical spectroscopy measurements in several prototypical compounds starting with the archetypal correlated material Sesquioxide V_2O_3 . We will also show first principles, material specific, LDA+DMFT calculations which are in very good agreement with the experiments [3].

[1]X. Deng, J. Mravlje, M. Ferrero, G. Kotliar, A. Georges

Physical review letters 110 (8), 086401 (2013)

[2]W. Xu, K. Haule, G. Kotliar

Physical review letters 111 (3), 036401 (2013)

[3]X. Deng, A. Sternbach, K. Haule, D. Basov and G. Kotliar to appear in PRL(2015).

Friday, January 23, 2015, 9:00 h, Room A 450, Theresienstr. 37/IV, LMU