



# TRR 80 Sonderseminar

Am Dienstag, den 9. Juli um 16:00 Uhr

spricht

***Prof. Dr. Karsten Held***

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über das Thema

***Spatio-temporal electronic correlations:  
From quantum criticality to  $\pi$ -tons***

Electronic correlations give rise to fascinating physical phenomena such as high-temperature superconductivity and (quantum) criticality, but their theoretical description remains a grand challenge. Dynamical mean field theory has been a big step forward: it accurately describes the local electronic correlations including their quantum, temporal dynamics. In recent years diagrammatic extensions of dynamical mean field theory, such as the dynamical vertex approximation, have been developed. These methods not only include the dynamics but also non-local correlations on all length scales [1].

After a brief introduction to these methods, I will present some recent highlights: the discovery of a new universality class of quantum critical exponents in the Hubbard model [2], the description of quantum criticality in the periodic Anderson model [3], and the discovery of new polaritons in strongly correlated electron systems, coined  $\pi$ -tons [4].

- [1] G. Rohringer, H. Hafermann, A. Toschi, A. A. Katanin, A. E. Antipov, M. I. Katsnelson, A. I. Lichtenstein, A. N. Rubtsov, and K. Held, *Rev. Mod. Phys.* 90, 025003 (2018)
- [2] T. Schäfer, A. A. Katanin, K. Held, and A. Toschi *Phys. Rev. Lett.* 119, 046402 (2017).
- [3] T. Schäfer, A. A. Katanin, M. Kitatani, A. Toschi, and K. Held *Phys. Rev. Lett.* (2019) accepted [arXiv:1812.03821].
- [4] A. Kauch, P. Pudleiner, K. Astleithner, T. Ribic, and K. Held [arXiv:1902.09342]

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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