



Physical Sciences Seminar

Spatio-temporal electronic correlations: From quantum criticality to π -tons

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Host: Georgios Katsaros

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 π -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. Schfer, A. A. Katanin, K. Held, and A. Toschi Phys. Rev. Lett. 119, 046402 (2017).

[3] T. Schfer, 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]

Tuesday, June 18, 2019 11:00am - 12:00pm

IST Austria Campus Mondi Seminar Room 2, Central Building



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