UNIVERSITÄT DUISBURG ESSEN

PHYSIK E=

Physikalisches Kolloquium

Mittwoch, 28.01.2026,
13:00 Uhr
MC 122 und Zoom

https://uni-due.zoom-x.de/j/64228670246?pwd=RjVQeFNIUkRKRkpiNVpKYXhJaFNLdz09 (gilt für alle Vorträge)

From cuprates to neural quantum states and quantum simulation

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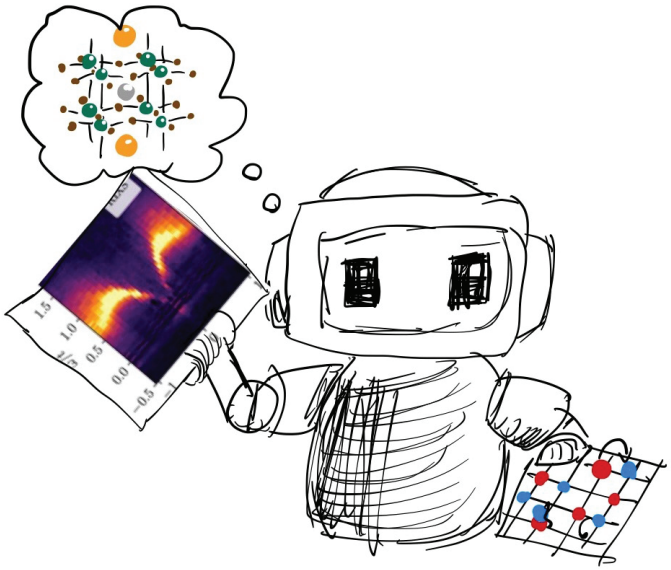

Following the discovery of high temperature superconductivity, unraveling its origins has become a key problem of condensed matter physics. From a model perspective, a wealth of research has concentrated on the paradigmatic Fermi-Hubbard model, which has been a key motivation for analog quantum simulation using fermionic atoms in optical lattices.
In this talk, I will motivate why -- following theoretical considerations as well as experimental observations -- a direct description of the cuprates by the conceptually simpler t-J model may be more appropriate. I will then demonstrate some of our recent efforts to understand the physics of these models through (i) neural quantum states, where the quantum state is represented by a neural network; and (ii) quantum simulation using cold atoms in optical lattices or tweezers.