

EINLADUNG zum IFP-SEMINAR

Quantum control of Hubbard excitons

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Host: Silke Bühler-Paschen

Termin: Mittwoch, 19. Februar 2025, 16:00 Uhr

Ort: TU Wien, Freihausgebäude

Wiedner Hauptstraße 8-10, 1040 Wien

Seminarraum DC rot 07 (roter Bereich, 7. OG)

Oder via ZOOM

<https://tuwien.zoom.us/j/63020566887?pwd=RmYvRmVwOGU5YVBrOHpodWRKaHFwQT09>

Vor dem Vortrag gibt es ab 15:30 Kaffee und Kekse

Abstract:

Over the past two decades, intense electromagnetic fields have been widely employed as a means to induce and control complex dynamical states in materials. Many of the most notable light-driven phenomena in condensed matter systems, including transient superconductivity and excitonic condensation, depend on strong electronic interactions combined with high susceptibility to external perturbations. Within this framework, one-dimensional Mott insulators hosting spin-charge separation and large optical nonlinearities emerge as a highly promising platform for investigating photoinduced non-equilibrium phases.

In this talk, I will present our recent results on the optical manipulation of the prototypical quasi-one-dimensional quantum chain Sr_2CuO_3 . First, I will demonstrate how low-frequency mid-infrared fields modify the third harmonic spectrum of this material by dressing the many-body states responsible for its pronounced optical nonlinearity, interpreting these effects within the Floquet paradigm. Next, I will show how near-resonant excitation combined with x-ray absorption spectroscopy provides insight into the local structure of these transient states. Finally, I will discuss the broader implications of these findings for realizing novel non-equilibrium ordering phenomena in photoexcited Mott insulators, such as η -pairing superconductivity.

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