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EINLADUNG zum IFP-SEMINAR

***Ab initio* Studies on Cuprate High- T_c Superconductors and their Consequences**

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Host: Karsten Held
Termin: Freitag, 10.10.2025, 11:00 Uhr
Ort: TU Wien, Freihausgebäude
Wiedner Hauptstraße 8-10, 1040 Wien
Seminarraum DB gelb 09 (gelber Bereich, 9. OG)

Abstract:

Realistic understanding and the mechanism of cuprate superconductors still remain a grand challenge in physics nearly 40 years after the discovery. Here, I talk recent progress enabled by multi-scale *ab initio* scheme for correlated electrons (MACE). Comprehensive studies with the help of machine learning on one-, two- and three-layer cuprate compounds consistently reveal the macroscopic origin of the universality (commonality) and detailed materials dependence quantitatively, which also offers a hint to future materials design. Furthermore, the *ab initio* study provides us with the realistic mechanism of the emergent attraction for the pairing together with a novel electron fractionalization, which is supported by a number of experiments such as angle resolved photoemission spectroscopy (ARPES), resonant inelastic X-ray scattering (RIXS) and quasiparticle interference (QPI).

Supported by:

FWF Österreichischer
Wissenschaftsfonds

