Nano-scale electronic structure of strongly correlated electron systems

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Stellingen

behorend bij het proefschrift

NANO-SCALE ELECTRONIC STRUCTURE OF STRONGLY CORRELATED ELECTRON SYSTEMS

1. Discrepancies between ARPES, STS, and quantum oscillations in quantum materials are a reflection of their strongly correlated nature. *Chapter 2 of this thesis*

2. The superconducting state of overdoped $Bi_2Sr_2CuO_{6+\delta}$ is best described as an emergent granular superconductor. *Chapter 3 of this thesis*

3. The process responsible for Cooper pair breaking in overdoped $Bi_2Sr_2CuO_{6+\delta}$ cannot be accurately described in a mean-field framework. *Chapter 3 of this thesis*

4. Self-supervision circumvents an important drawback of supervised machine learning in spectroscopy imposed by the limited availability of data. *Chapter 4 of this thesis*

5. The puddles of charge modulation in non-superconducting overdoped $Bi_2Sr_2CuO_{6+\delta}$ are signatures of strong QPI rather than charge ordering. *Li et al. PRX **11**, 01107 (2021)*

6. The anomalous behavior of the Van Hove singularity in $Bi_2Sr_2CuO_{6+\delta}$ goes beyond local shifts in chemical potential. *Webb et al. PRX **9**, 021021 (2019)*

7. While offering a significant increase in measurement speed, parallel spectroscopy has only limited application for quantum materials due to the reduced energy resolution. *Zengin et al. PRR **3**, L042025 (2021)*

8. The accurate determination of the gap structure using quasi-particle interference by Sharma et al. is held back by not addressing the rich physics of the Sr_2RuO_4 surface. *Sharma et al. PNAS **117**:10 (2020)*

9. Public engagement by scientists should more often address the way science works in addition to the topic at hand.

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