



Universiteit  
Leiden

The Netherlands

## Nano-scale electronic structure of strongly correlated electron systems

Tromp, W.O.

### Citation

Tromp, W. O. (2022, December 20). *Nano-scale electronic structure of strongly correlated electron systems*. *Casimir PhD Series*. Retrieved from <https://hdl.handle.net/1887/3503554>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3503554>

**Note:** To cite this publication please use the final published version (if applicable).

# 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  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+\delta}$  is best described as an emergent granular superconductor. *Chapter 3 of this thesis*
3. The process responsible for Cooper pair breaking in overdoped  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+\delta}$  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  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+\delta}$  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  $\text{Bi}_2\text{Sr}_2\text{CuO}_{6+\delta}$  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  $\text{Sr}_2\text{RuO}_4$  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.

*Willem Olivier Tromp  
Leiden, December 20th 2022*