Sven Kersch

M.Sc.

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Master's Thesis

Title: *Optical Properties of Interlayer Excitons in Twisted Transition Metal Dichalcogenides*

Supervisors: Prof. Dr. Tobias Korn, Dr. Christopher Gies

Abstract: Theoretical modeling of the optical response of interlayer excitons in semiconducting heterobilayers with a focus on transition metal dichalcogenides. Special attention was given to the spin and spatial dependence of the excitons, and the results were compared with findings from scientific literature. The moiré pattern arising in the heterobilayer was found to be a fundamental cause of position-dependent polarization.

Bachelor's Thesis

Title: *Dynamics of Coupled Dipoles on Surfaces*

Supervisor: Prof. Dr. Stefan Scheel

Abstract: A theoretical analysis of the dynamics of immobilized atoms in the presence of macroscopic dielectrics based on quantum electrodynamics. The focus was on geometrical parameters and their influence on the occupation probability of two coupled two-level systems.

Education

M.Sc., *University of Rostock*. **June 2021**
Physics, with core subjects in Advanced Quantum Theory and Research Internship. Elective modules included Photonics, Quantum Optics, and Nonlinear Spectroscopy.

B.Sc., *University of Rostock*. **October 2017**
Physics, including foundational modules in theoretical and experimental physics and extensive laboratory courses.

High School Diploma, *Erich-Kästner Comprehensive School*, **May 2013** Elmshorn.
General qualification for university entrance with honors in Philosophy.

Professional Experience

Consultant, *Freelance*. **2024–2025**
Consulting in field of research, industry and education.

Lecturer, *Freelance*. **2024–2025**
Courses in Physics

Scientific Writer, *Freelance*. **2024–2025**
Writing scientific texts and analyses

Research Scientist, *Medical Laser Center*, Lübeck. **2023**
Research on photoacoustically induced vascular permeability

Laser Engineer, *Coherent LaserSystems*, Lübeck. **2022–2023**
Worked in laser assembly for the Paladin Scan/Dual system

PhD Student, *Working Group Rohlfing/Krüger*, University of Münster. **2021–2022**
Theoretical Solid State Physics

Working Student, *Kofler Energies*, Rostock. **2020–2021**
Technical assistant in construction supervision

Research Assistant, *Fraunhofer IGP*, Rostock. **2019–2020**
Analysis of point-cloud-like data, optical measurement of large structures

Working Student, *Ingenieurbüro Rüdiger*, Rostock. **2017–2018**
Calculation of thermal loads for heating and sanitary systems

Student Assistant, *University of Rostock*. **2017**
Correction of exercises

Student Assistant, *University of Rostock*. **2017**
Testing innovative teaching methods in didactics

Languages

German: Native speaker

English: C1

Computer Skills

Operating Systems: Windows, Linux

Programming: Python, Fortran, C++

Mathematical Tools: Mathematica, Matlab

Other: LaTeX, MS Office, Git