

## Education

- 04/2025–04/2026 **Master Thesis**, *California Institute of Technology, Endres Lab*
- 10/2023–04/2026 **M.Sc. Quantum Science and Technology**, *TU Munich & LMU Munich*, Current Grade: 1.2
- 10/2021–05/2025 **B.Sc. Business Administration and Technology (TUM-BWL)**, *Technical University of Munich*, Final Grade: 1.8; Thesis: 1.0
- 10/2019–10/2022 **B.Sc. Physics**, *Technical University of Munich*, Grade: 1.4 (top 15%); Thesis: 1.0
- 09/2011–06/2019 **German Abitur**, *Karls-Gymnasium, Stuttgart*, Final Grade: 1.0

## Research Experience

- Since 04/2025 **Full-time Researcher**, *California Institute of Technology, Endres Lab, Pasadena, CA*  
Master thesis on building a novel dark SPOT magneto-optical trap (MOT) for continuous Cs atom loading in neutral atom quantum computer:
- Simulating atomic physics to achieve very high flux, high phase-space density MOT
  - Designing and building complete laser cooling and trapping system, including laser setup and locking setup, high-power beam delivery, DMD-based beam shaping for spatially selective atom preparation, absorption imaging of atomic cloud, and control electronics
- 04/2024–03/2025 **Student Intern**, *Max Planck Institute of Quantum Optics, Bloch Group, Garching*  
Built optical systems for neutral atom quantum computing with strontium atoms:
- Designed, built, and characterized fiber noise cancellation system
  - Built an injection lock for laser amplification; this system was used for the realization of a Fast Triple-Magic All-Optical Qutrit in  $^{88}\text{Sr}$
  - Characterized optical metasurface for flat-top beam shaping
- 03–07/2024 **Student Researcher**, *TU Munich, Chair of Communication Networks (Prof. Kellerer), Munich*  
Bachelor thesis (TUM-BWL) on simulating experimental node-to-node entanglement protocols:
- Identified most relevant experimental entanglement methods through systematic literature review
  - Developed parameter abstraction framework to extract and standardize hardware specifications from diverse experimental papers for network simulation
  - Co-authored paper in *IEEE Transactions on Quantum Engineering* (2nd Author)
- 03/2023–03/2024 **Student Intern**, *Rohde & Schwarz, Innovation Department, Munich*  
Worked on an atomic vapor cell-based broadband spectrum analyzer:
- Developed Monte Carlo simulation of atoms evolving under time-dependent Schrödinger equation to model how atomic motion through magnetic field gradients affects spectrum analyzer resolution
  - Optimized time-dependent differential equation solver using NumPy vectorization, Numba JIT compilation, sparse matrices, and parallelization, achieving more than 500x speedup
- 10/2022–06/2023 **Student Intern**, *Max Planck Institute of Quantum Optics, Reiserer Group, Garching*  
Characterized Fiber Bragg Grating (FBG) cavities for laser stabilization:
- Spliced optical fibers and FBGs to create different cavity configurations
  - Developed Python-based automated measurement script using ARTIQ and Picoscope for data acquisition and control
  - Investigated polarization-dependent behavior and analyzed cavity performance metrics (Q-factor, finesse) across multiple FBG samples
- 05–08/2022 **Full-time Researcher**, *Max Planck Institute of Quantum Optics, Reiserer Group, Garching*  
Bachelor thesis on cryogenic packaging in silicon nanophotonics:
- Experimentally realized and investigated SU8-capped tapered fibers for enhanced adiabatic fiber-to-chip coupling to silicon ridge waveguides
  - Simulated optimal coating parameters (thickness, angle, overlap length) using FDTD and FEM methods in ANSYS Lumerical

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## Other Work Experience

- 09/2024–03/2025 **Founder's Associate Intern**, *PlanQC*, Munich  
Worked directly with founders of neutral atom quantum computing startup that raised a \$50M Series A:  
  - Contributed to release of final \$50M Series A tranche by developing and presenting ESG policy that fulfilled critical post-signing covenant at board meeting
  - Authored technical grant application sections on neutral atom quantum computing advantages
- 04/2020–11/2021 **Python Developer & Engineer**, *OmicEra Diagnostics*, Munich  
Built a data analysis pipeline for a Mass spectrometry proteomics company (a spin-off from Matthias Mann group at Max Planck Institute of Biochemistry):  
  - Designed automated data analysis pipeline using Python and Streamlit for processing and quality control of proteomics MS/MS data
  - Applied machine learning clustering methods to identify root causes of systematic outliers in mass spectrometry measurements

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## Publications

- 2025 M. Baier, R. Rosenauer, V. Li, C. Deppe, and W. Kellerer, "Combined Physical and Link Layer Protocols for Quantum Networks," *IEEE Transactions on Quantum Engineering*, vol. PrePrints, pp. 1–14, 2025. <https://doi.org/10.1109/TQE.2025.3630201>
- 2025 F. Eckstein, R. Rosenauer, P. Huppert, et al., "RFC 9116 ('security.txt') an deutschen Hochschulservern," *Datenschutz und Datensicherheit*, vol. 49, pp. 522–526, 2025. <https://doi.org/10.1007/s11623-025-2132-1>

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## Honors and Awards

- 2025 **Research Scholarships**, *MQV Exchange Fellowship (\$6K)*, *German-American Women's Club (\$10K/yr)*, *Rohde Foundation (\$2.5K)*
- 06/2024 **ZEISS European Summer School**, *Semiconductor Manufacturing Technology – intensive program on lithography optics, DUV/EUV, silicon photonics (ZEISS, Intel, Nokia, Siltronic experts)*
- 2021–2025 **Hackathon Awards**, *Multiple top placements at major hackathons including 2nd place overall at Munich Defense Tech Hackathon (2025, 1st in Quantum Systems challenge), 3rd place at HackZurich (2023, Europe's largest hackathon), 1st place at TUM AI Makeathon Applied AI track (2023, 3rd overall), and 1st place at HackaTUM Rohde & Schwarz SatChallenge (2021)*
- Since 02/2023 **Honors Degree CDTM**, *TUM & LMU*  
Technology management add-on degree:  
  - Selected as one of 25 from 400+ applicants.
  - Alumni hold leadership positions in industry and academia and have founded over a quarter of Germany's unicorn startups.
- 04/2020 **Fellow of the German Academic Scholarship Foundation**  
Awarded fellowship by Germany's most prestigious scholarship foundation.  
  - Provides financial support, mentorship, and comprehensive education program.
  - Awarded to less than 0.5% of German students.
- 01/2016–09/2017 **German National Debating Team**, *Debating Society Germany*  
Represented Germany at the World School Debating Championship in Bali

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## Leadership and Extracurricular Activities

- 04/2021–04/2022 **Scholarship Representative**, *German Academic Scholarship Foundation*, Munich  
Elected representative for scholarship recipients in the Munich region. Organized social, academic, and cultural events to foster an active community among members. Coordinated extracurricular activities and facilitated networking opportunities.
- 2021–2025 **Founder and Leader of Studienstiftung Debating Group**, *Munich*  
Established and lead weekly forum for discussions on contemporary political and societal issues using British Parliamentary and World Schools debate formats