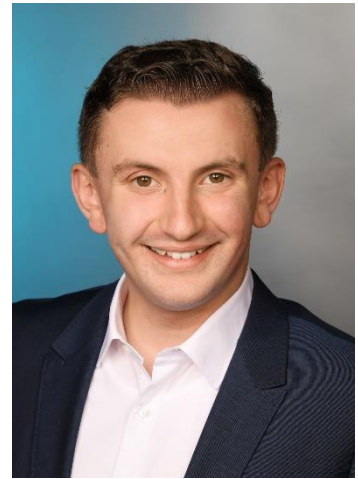# Tobias Offermann

M.Sc. Physics, MBA student

👤 Profile

A dedicated Data Scientist at Porsche and MBA student at Collège des Ingénieurs, specializing in leveraging advanced technologies such as big data, machine learning, AI, quantum computing, and semiconductor physics for industrial applications. Passionate about transforming data into actionable insights to enhance business performance and contribute to the future of technology-driven business solutions.

🎓 Education

Master of Business Administration (MBA), Collège des Ingénieurs, Munich, Paris, Turin
January 2024 — Present

Tri-National Merit-Based MBA Program for Scientists and Engineers

- **Industry-Financed**: This unique MBA program is funded by leading industry partners, ensuring a strong integration of academic learning with practical business applications.

- **Specialized Curriculum**: Tailored for technical professionals, the program focuses on business strategy, entrepreneurial ventures, innovation management, and leadership skills.

- **Real-World Engagement**: Participants are involved in practical projects and case studies with industry giants such as Infineon, schwarz IT, and Air Liquide, bridging the gap between technical expertise and business acumen.

Physics M.Sc., RWTH Aachen University, Aachen
August 2021 — November 2023

Specialisation track: Quantum Technology

Final grade: 1.1

Master's Thesis: "Spin-Coherent Conveyor-Mode Shuttling of Electrons in Si/SiGe"

- Conducted research in the Quantum Technology Group of Prof. Hendrik Bluhm, part of the Matter and Light for Quantum Computing (ML4Q) research cluster and the Jülich Aachen research alliance (JARA).

- **Key Tasks:**
  - Performed measurement and data analysis of an Si/SiGe electron shuttle device at millikelvin temperatures.
  - Conducted mass-characterisation of in-house fabricated devices at 4 K to identify new devices for millikelvin experiments and compare different Si/SiGe heterostructures.

Details

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Date / Place of birth
09.10.1999
Simmerath

Nationality
German

Links

LinkedIn
XING
Website

Programming languages

Python

C

Java

Skills

Data Analysis

Quantum Computing

Generative AI

Financial Analysis

Business Strategy

- **Key Results:**
  - Published two papers detailing the project findings.
  - Presented research findings at a major conference.
  - Successfully identified and evaluated multiple samples suitable for future experiments, highlighting strengths and weaknesses of various Si/SiGe heterostructures.

Chalmers University of Technology, Gothenburg
August 2021 — June 2022

Exchange as part of the Erasmus program.

- **Key Achievements:**
  - Very good results in a variety of courses about superconductivity, quantum information, and solid-state physics.
  - Worked on a student's project about transpiling a quantum circuit to given hardware restrictions using Qiskit.

- **Key Results:**
  - Got an internship position in a lab working on quantum information and extended my stay abroad.
  - Learned how to operate and work with IBM's Qiskit.

Physics B.Sc., RWTH Aachen University, Aachen
October 2018 — September 2021

Final grade: 1.8

Bachelor's Thesis: "Wave Packets in Strained Bilayer Graphene"

- Conducted at the Institute of Quantum Information, supervised by Prof. Fabian Hassler.
- Analytically and numerically investigated the quantum mechanical properties of probability density and current in strained bilayer graphene.

- **Results:**
  - Calculations provided initial insights into the unusual experimental properties of bilayer graphene.

Abitur, Franziskus-Gymnasium, Vossenack
July 2010 — May 2018

Final grade: 1.0

Results:

- Received awards for outstanding achievements in physics (DPG-Abiturpreis) and mathematics (DMV-Abiturpreis).
- Awarded a scholarship by the Friedrich Ebert Stiftung, primarily based on excellent academic performance.

Soft Skills

Data Visualization

Teaching and Training

Technical Communication

Languages

German

English

French

Swedish

Chinese

Hobbies

Fitness, Language learning, Attending live music events, Role-playing games

💼 Professional Experience

Data Scientist at Porsche AG, Weissach
February 2024 — Present

- Practical component of MBA studies in the Systems Engineering section of the Energy System Division within the R&D Department.

- **Key Responsibilities:**
  - Analyzed complex datasets related to suppliers, customers, and development processes to drive insights and support decision-making.
  - Developed and implemented machine learning models using Python, Pandas, and time series analysis to optimize various aspects of energy systems.
  - Collaborated with cross-functional teams to integrate advanced data analytics into ongoing projects.
  - Utilized data visualization tools to present findings to stakeholders and support strategic initiatives.

- **Key Achievements:**
  - Enhanced production processes of suppliers through data-driven analysis and optimization.
  - Build up knowledge in time series analysis and working with Azure Synapse.

Teaching Assistant: "Spin Qubits" Lecture at RWTH Aachen
April 2023 — July 2023

- **Key Responsibilities:**
  - Designed and evaluated exercise sheets to reinforce lecture concepts.
  - Led tutorial sessions and facilitated paper discussions to deepen students' understanding.

- **Key Achievements:**
  - Successfully conveyed the fundamentals of spin-qubits, ensuring students grasped core concepts.
  - Developed expertise in creating effective exercise sheets, tailored to students' knowledge levels, expected workload, and didactic methods.

Teaching Assistant: "Advanced Lab Course" at RWTH Aachen,
February 2023 — April 2023

- **Key Responsibilities:**
  - Supervised experiments where students used LabView to measure properties of transistors, Schmitt-Triggers, voltage rectifiers, and amplifiers.
  - Graded lab reports submitted by students, providing constructive feedback.

- **Key Achievements:**
  - Successfully guided all students to perform their experiments accurately and efficiently.
  - Gained significant experience in evaluating scientific work and delivering appropriate feedback to enhance students' learning outcomes.

Research internship at 202Q-lab at Chalmers University of Technology, Gothenburg
July 2022 — September 2022

- Worked in the group of Prof. Simone Gasparinetti, part of the Wallenberg Centre for Quantum Technology (WACQT).

- **Key Tasks:**
  - Measured properties of two superconducting qubits coupled by an array of metamaterial cavities.
  - Analyzed results by developing an analytical model for the system and solving the Hamiltonian numerically to compare with measurement data.
  - Developed scripts for the automatic measurement of the qubits' anharmonicity.

- **Key Results:**
  - Successfully fitted the theoretical model to the experimental data and implemented the automated script for measuring anharmonicity.
  - Gained hands-on experience in cryogenics, microwave electronics, signal processing, and quantum information.

Working student at Elwema Automotive GmbH, Monschau
August 2018 — April 2020

- **Key Responsibilities:**
  - Simulated and programmed multiple industrial robots in modular cleaning systems for cleaning car engines, suspensions, and transmission parts.

- **Key Achievements:**
  - Developed simulation code that served as a foundation for the installation process, significantly saving time and money.
  - Enabled preemptive investigation of machine failure modes and new parts, enhancing overall efficiency and reliability.

Electrical engineering internship at Otto Junker GmbH, Simmerath
February 2017

- **Key Tasks:**
  - Set up wiring for simple household electronics and small cable steers.

- **Key Results:**
  - Acquired the ability to read and interpret electrical circuit diagrams.
  - Developed skills in efficiently installing electrical circuits.

▥ Awards, Scholarships, and Other Achievements

Scholarship by Friedrich-Ebert-Stiftung e.V.
October 2020 — Present

Awarded based on exemplary social commitments and outstanding academic achievements in high school. Actively participated in seminars and workshops focused on rhetoric strategies, as well as efficient work and study techniques.

◢ Publications

Papers

Spin-EPR-pair separation by conveyor-mode single electron shuttling in Si/SiGe

Nature communications, volume 15, Article number: 1325 (2024)

Available under https://www.nature.com/articles/s41467-024-45583-7

Mapping of valley-splitting by conveyor-mode spin-coherent electron shuttling

npj Quantum Information, volume 10, Article number: 61 (2024)

Available under https://www.nature.com/articles/s41534-024-00852-7

Talks

Coherent Conveyor Mode Shuttling of Electrons and their Spin

DPG-Frühjahrstagung der Sektion Kondensierte Materie, Dresden (2023)

Abstract available unter http://bit.ly/dpg_talk_TO

⛪ Courses

Practical introduction to deep learning for computer vision, Hasso Plattner Institut, Potsdam
March 2020 — April 2020

⋎ Extra-curricular activities

IDEA League Summer School, Aachen
September 2023

Summer School titled 'Scalable Quantum Computing - From First Principles to Market'.

The topics covered include neutral atoms, trapped ions, superconducting qubits, spin qubits, error correction and scalability requirements.
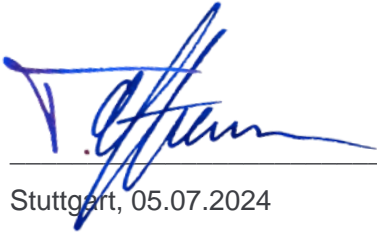
Quantum Futur Akademie Spezial, Munich
June 2023

Stay at the LASER World of Photonics/World of Quantum trade fair in Munich, funded by the BMBF (Federal Ministry of Education and Research).

iQuHack

Participation in the iQuHack Hackathons 2022 and 2023, hosted by the Massachusetts Institute of Technology

- **Subjects:**
  - **2022**: Quantum communication and cryptography
  - **2023**: Quantum image processing
-
- **Projects:**
  - **2022**: Developed a chat framework that quantum-encrypts messages using the BB84 protocol.
  - **2023**: Created a method for encrypting images into quantum data, utilizing quantum machine learning to classify images.

Stuttgart, 05.07.2024