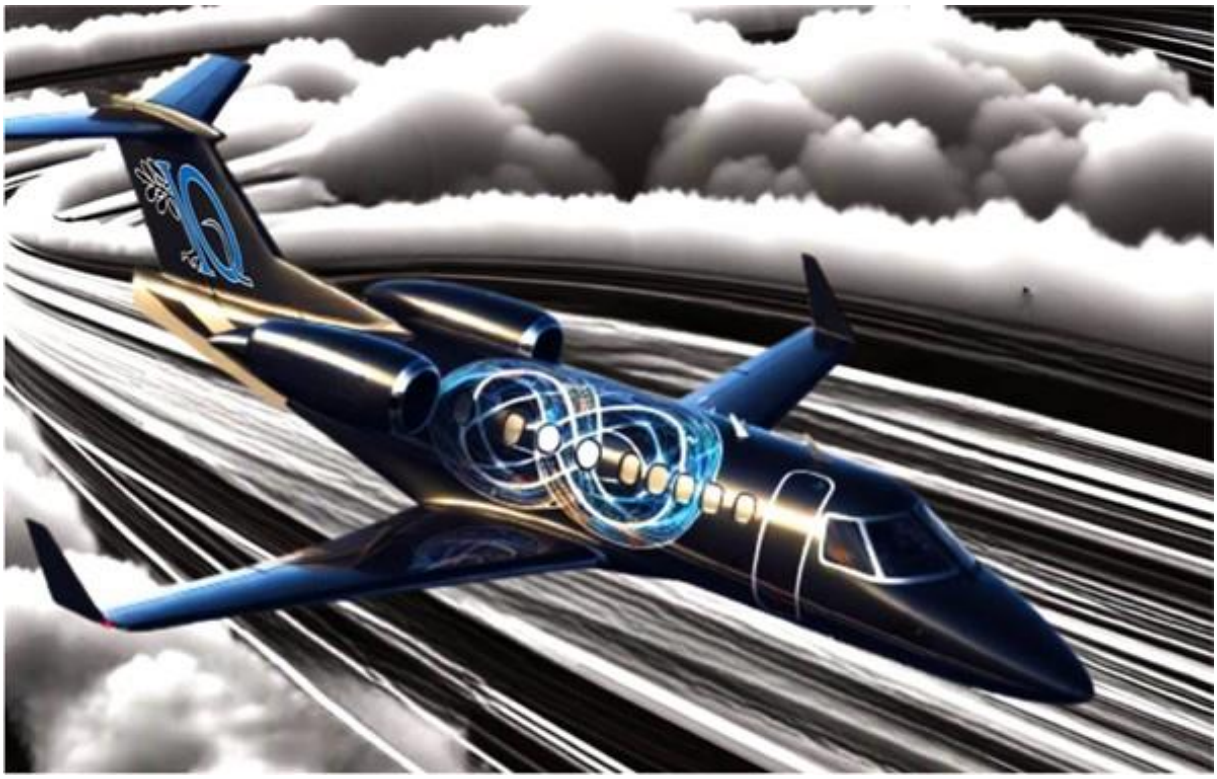
PhD Student — Software for Quantum Control (m/f/d)
(MSc in Physics, Electrical Engineering, or Computer Science)

Are you looking for an opportunity to shape the future of quantum computing? With superconducting quantum computers on the verge, we aim to strengthen our research team at the Technical University of Munich (TUM – www.tum.de) in collaboration with the Walther-Meißner-Institute (WMI – www.wmi.badw.de) of the Bavarian Academy of Sciences and Humanities (BAdW) and open a PhD researcher position for a quantum control software and machine learning expert.

How you will support us:

- You will take on responsibilities in the field of control and operation of high-coherence superconducting quantum circuits with a main focus on the development of control software.
- You will design and implement advanced control and readout protocols and optimize experimental characterization workflows leveraging machine learning techniques to enhance the performance of superconducting quantum processors.
- You will lead the control software development towards the project goals of the EQuIPS project, which has recently been funded by the BMBF.
- You will contribute to the daily operations of our new experimental laboratory at the Center for Quantum Engineering (ZQE – www.zqe.tum.de).
- You will supervise and mentor Bachelor's and Master's students, supporting their academic and research development.
- You will be part of a dynamic international team dedicated to advancing quantum technologies and computing with superconducting qubits.
- You will work at the interface of fundamental research and technological innovation, collaborating closely with partners from academia, research institutions, and industry.
- You will actively present your research at conferences, workshops, and through scientific publications.



Your profile:

- You hold an MSc degree in physics, engineering, or computer science.
- You are very experienced in Python programming and know how to use version control.
- You are experienced in the usage of machine learning (e.g., Actor-critic algorithms, deep neural networks, support vector machines, unsupervised learning methods)
- You a keen interest in exploring the control and readout of superconducting qubits and like to push the software interface further to enable high-quality quantum operations.
- You work in an organized manner and pay attention to details.
- You thrive on finding solutions to complex problems.
- You have strong communication and writing skills.

What can you expect in return:

- A curiosity-driven, technology-focused research environment with an international team of scientists and researchers at TUM, working on superconducting quantum circuits, hybrid quantum systems, and magnetic materials.
- A dynamic, multidisciplinary research environment at the Research Campus in Garching, one of Europe's most advanced centers for research and education, featuring internationally renowned programs in quantum science and technology.
- Close connection to the activities of the Munich Quantum Valley with its main goal to build a quantum computer based on different platforms, to develop suitable algorithms and applications, and to establish an ecosystem for innovative quantum technologies.
- A remuneration according to qualifications in accordance with the collective bargaining agreement of the German federal states (depending on qualification up to TVL-E13).

How to apply. If your aim is to advance superconducting quantum computing and you are motivated to join the team, we would be happy to receive your application before June 30, 2025. Please send us your documents, including your CV, relevant documents, and a brief motivation letter in a single PDF file to Benjamin Lienhard (Benjamin.Lienhard@tum.de) mentioning the subject '2025-Control-PhD'. Positions are available starting immediately. Applications may be considered until the position is filled.

Diversity. We are determined to build an inclusive culture that encourages and values the diverse voices of all members of our research team, embracing the full diversity of gender identities, cultures, and ideologies to do excellent research. We strive to raise the proportion of women in their workforce and explicitly encourages applications from qualified women. The position is suitable for severely disabled persons. Applicants with severe disabilities will be given preference if their suitability, qualifications and professional performance are otherwise essentially equal.

Data Protection Information. When you apply for a position with the Technical University of Munich (TUM), you are submitting personal information. With regard to personal information, please take note of the Datenschutzhinweise gemäß Art. 13 Datenschutz-Grundverordnung (DSGVO) zur Erhebung und Verarbeitung von personenbezogenen Daten im Rahmen Ihrer Bewerbung. (data protection information on collecting and processing personal data contained in your application in accordance with Art. 13 of the General Data Protection Regulation (GDPR)). By submitting your application, you confirm that you have acknowledged the above data protection information of TUM.