



Learning, Characterizing, Testing of Bosonic Quantum Computers



Foto: format24

We are one of the largest and oldest universities in Europe and one of the most important employers in our region. Our broad range of subjects, the dynamic development of our main research areas and our central location in Cologne make us attractive for students and researchers from around the world. We offer a wide range of career opportunities in science, technology, and administration.

Embedded into the Institute for Theoretical Physics and the Cluster of Excellence ML4Q, the team of Dr Markus Heinrich studies the power and limitations of near-term quantum computers using mathematically rigorous methods. www.quantum-randomness.com

YOUR TASKS

- » Join the European QuantERA consortium “Bosonic quantum computers, learning, characterization and testing”
- » Contribute to a toolbox for the characterization of bosonic quantum computers
- » Develop new theoretical methods to benchmark these devices and to efficiently and robustly read out relevant information
- » Study connections to classical simulation, quantum error correction, and random unitaries
- » Present your results at prestigious international workshops and conferences
- » Build close research collaborations within the consortium and deepen them through regular research visits and a longer research stay
- » Transfer your results into practice: work closely with the software team at the consortium partner Alice & Bob

YOUR PROFILE

- » Master’s degree with excellent marks in physics, computer science, mathematics, or a related field; thesis in quantum information/computing preferred
- » Strong interest in quantum information theory & computing
- » Strong mathematical thinking; ideally with prior knowledge of representation theory or a strong motivation to learn it
- » Prior knowledge of one or more of the following is a plus: bosonic systems, randomized benchmarking, classical shadows, classical simulation, random unitaries
- » Very good communication skills, high level of motivation, and the ability to conduct work independently

WE OFFER

- » A diverse working environment with equal opportunities
- » Support in balancing work and family life
- » Flexible working time models
- » Extensive advanced training opportunities
- » Occupational health management offers

The University of Cologne promotes equal opportunities and diversity. Women will be considered preferentially in accordance with the Equal Opportunities Act of North Rhine-Westphalia (Landesgleichstellungsgesetz – LGG NRW). We also expressly welcome applications from all suitable candidates regardless of their gender, nationality, ethnic and social origin, religion, disability, age, sexual orientation and identity.

The position is available from 1 December 2026 on a part-time basis (29,87 hours per week). The position is to be filled for a fixed term until 30 November 2029. If the applicant meets the relevant wage requirements and has the appropriate personal qualifications, the salary is based on remuneration group 13 TV-L of the pay scale for the German public sector.

Please apply online with proof of the required qualifications (without a photo) under <https://jobportal.uni-koeln.de> The reference number is Wiss2607-06. The application deadline is 12 August 2026.

For further inquiries, please contact Dr Markus Heinrich at (markus.heinrich@uni-koeln.de) and take a look at our [FAQs](#).