



UNIVERSITY
OF COLOGNE

Faculty of Mathematics and Natural Sciences

Postdoc Position (f/m/x) on TI-SC hybrid devices with the goal of building a Majorana qubit at the Institute of Physics Institute II



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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.

The group of Professor Yoichi Ando in the Institute of Physics II of the University of Cologne is trying to elucidate the non-Abelian nature of the Majorana zero modes generated in a topological insulator (TI) platform and to build a Majorana qubit. The successful candidate will work on TI-superconductor hybrid devices to understand the mesoscopic topological superconductivity realized in such a platform, to detect and manipulate the emergent Majorana zero modes, and to read out the results of manipulation via charge-parity measurements.

YOUR TASKS

- » Nanofabrication of nanostructured hybrid devices combining superconductor and TI with gates
- » Ultra-low-temperature experiments to understand the proximity-induced mesoscopic superconductivity in such devices
- » Developments of the charge-parity readout technology using quantum dots for such devices

YOUR PROFILE

You must hold a PhD degree in Experimental Solid-State Physics or Nanoscience and must have hands-on experience in a subset (at least 3) of the following:

- » Nanofabrication of devices using electron-beam lithography
- » Ultra-low noise transport measurements
- » Ultra-low temperature experiments in a dilution refrigerator
- » Time-domain microwave measurements
- » Circuit QED experiments
- » Experiments on TI-superconductor hybrid devices
- » Quantum transport experiments in mesoscopic systems such as quantum wires, quantum dots or quantum Hall systems

WE OFFER

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

The University of Cologne is committed to equal opportunities and diversity. Women are especially encouraged to apply and will be considered preferentially in accordance with the Equal Opportunities Act of North Rhine-Westphalia (Landesgleichstellungsgesetz – LGG NRW). We also expressly welcome applications from people with disabilities / special needs or of equal status.

The position is available from 01.10.2024 on a full-time basis (39,83 hours per week). The initial contract is to be filled for a fixed term until 31.12.2025. If the applicant meets the relevant wage requirements and personal qualifications, the salary will be 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 Wiss2403-20. The application deadline is 11.04.2024.

For further inquiries, please contact Dr Harald Kierspel kierspel@ph2.uni-koeln.de.



HR EXCELLENCE IN RESEARCH