

# PhD position (f/m/d) - Current noise in topological insulators

Matter and Light for Quantum Computing (ML4Q) | Group of Prof. Bocquillon

Foto: Thomas Josef

The University of Cologne is one of the largest and most research-intensive universities in Germany, offering a wide range of subjects. With its six faculties and its interfaculty centres, it offers a broad spectrum of scientific disciplines and internationally outstanding profile areas, supported by the administration with its services.

The Faculty of Mathematics and Natural Sciences comprises six departments with about 180 professors and 9,000 students and is one of the largest faculties in the country.

A PhD position (f/m/d) is available in the group of Prof. Erwann Bocquillon. The group is newly established in the frame of the Cluster of Excellence „Matter and Light for Quantum Computing“ and investigates quantum transport in topological insulators.

More information on our webpage: <https://ph2.uni-koeln.de/arbeitsgruppen/bocquillon>.

## YOUR TASKS

In recent years, topological insulators have revealed spectacular properties inherited from the topological properties of their band structures. The quantum anomalous Hall effect falls in this category, with a single edge state at zero magnetic field. The extraordinary properties of this material open prospects for novel spintronics devices without ferromagnets, and appear as a promising candidate platform for topological quantum computation.

During your PhD thesis, you will:

- » fabricate nano-scale devices
- » develop setups for measurements at low-frequencies and/or high-frequencies (GHz)
- » explore the transport of topological edge states of the quantum anomalous Hall effect
- » study the coupling to superconductors and/or ferromagnets

## YOUR PROFILE

- » the candidate should hold a Masters in Physics, with preferably a major in Quantum Physics or Condensed Matter Physics
- » Experience in a subset of the following fields will be appreciated:
  - » cryogenic systems
  - » quantum transport measurements
  - » nano-fabrication and clean-room techniques
  - » GHz/microwave techniques

## WE OFFER YOU

- » a diverse and fair working environment
- » support in reconciling work and family life
- » flexible working time models
- » extensive advanced training opportunities
- » occupational health management offers
- » local transport ticket at a discount for UoC employees

The position is available as soon as possible on a part-time basis (50% / 19,92 hours per week). The PhD position is paid on a 50% basis in the 1st year, and 75% afterwards. It is initially limited to a term of 3 years. If the applicant meets the relevant wage requirements and personal qualifications, the salary is based on remuneration group 13 TV-L of the pay scale for the German public sector.

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.

Please apply online at: <https://jobportal.uni-koeln.de> with proof of the sought qualifications. The reference number is Wiss2201-01. The application deadline is 02.02.2022.

For more information about the projects, please contact Prof. Erwann Bocquillon via email: [bocquillon@ph2.uni-koeln.de](mailto:bocquillon@ph2.uni-koeln.de).