UCLouvain
Institute of Condensed Matter and Nanosciences,
Functional Quantum Devices Lab, UCLouvain

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FUNCTIONAL QUANTUM DEVICES
Gehring Lab

Post-doc position in Transverse Thermoelectric Quantum Materials

The Gehring Lab (www.gehring-lab.be) investigates quantum effects in low-dimensional materials to develop novel functional devices. Our research focuses on cryogenic solid-state cooling, where we explore thermoelectric and electrocaloric effects and advance cryogenic thermal management at the nanoscale. We combine electrical and thermal transport measurements down to millikelvin temperatures, cryogenic thermometry, high magnetic fields, and cryogenic scanning probe microscopy to probe and control heat and charge flow in quantum materials.

About the Project

As part of the project *"Low-dimensional Transverse Thermoelectric Materials for Sustainable Spot Cooling and Energy Harvesting"*, funded by the Walloon Excellence in Technology (WEL-T) programme, we invite applications for a 2-year postdoctoral position.
The project aims to advance the field of thermoelectrics by developing hybrid transverse thermoelectric devices based on 2D materials, with applications in efficient energy harvesting and solid-state cooling. Specifically, we seek to enhance transverse thermoelectric effects (TTE) by engineering heterostructures of 2D materials, combining non-trivial topology, magnetism, and strong anisotropy into a single hybrid compound.
By combining cutting-edge experimental techniques with the versatility of 2D nanostructured materials, this research intends to push thermoelectric performance beyond the current state of the art. The results will pave the way for compact, high-efficiency thermoelectric systems for both cooling and energy harvesting applications.

Research Topics

- Two-dimensional quantum materials
- Transverse thermoelectric effects
- Cryogenic scanning probe microscopy
- Magnetotransport experiments
- Device nanofabrication

Candidate Profile

- PhD in physics, materials science, nanotechnology, or a related discipline
- Strong background in low-temperature physics, transport measurements, 2D materials, or spintronics
- Experience with cryogenics, nanofabrication, or advanced characterization techniques is an asset
- Motivation to work in an interdisciplinary and collaborative research environment

We Offer

- A fully funded 2-year postdoctoral position
- Access to state-of-the-art low-temperature and scanning probe facilities
- An interdisciplinary and international research environment at UCLouvain
- Opportunities to collaborate with leading groups in quantum materials and thermoelectrics

Application Procedure

To apply, please send the following documents in a single PDF file to pascal.gehring@uclouvain.be:

- Curriculum Vitae
- Motivation letter
- Names and contact details of two references

Applications will be reviewed on a rolling basis until **10 September 2025**, with an expected starting date of October 2025.
For informal inquiries, please contact Prof. Dr. Pascal Gehring at the above email address.