

Netherlands:PhD candidate in Nematic superconductivity in topological materials

The Institute of Physics (IoP) of the Faculty of Science combines the Van der Waals-Zeeman Institute (WZI), the Institute of Theoretical Physics (ITFA) and the Institute for High Energy Physics (IHEF) and is one of the large research institutes of the faculty of Science at the University of Amsterdam. A PhD position is available in the [Quantum Matter Amsterdam Group](#) of the WZI at the University of Amsterdam.

Research

Superconductivity is a fascinating state of matter. The project focuses on new family of superconductors that is obtained by doping a topological insulator: Bi₂Se₃-based superconductors. We will explore a recent experimental discovery, namely rotational symmetry breaking in the macroscopic superconducting parameters [1]. The rotational symmetry breaking is attributed to an unconventional superconducting state with odd-parity symmetry. By examining the superconducting parameters in detail we wish to provide solid proof for nematic superconductivity in the Bi₂Se₃-based superconductors. The novel insight might turn out to be crucial in the design of new topological superconductors. [1] Y. Pan et al., Sci. Reports 6, 28632 (2016).

Project description

In this PhD project the superconducting properties of the family of Bi₂Se₃-based superconductors will be investigated by different experimental techniques, such as torque magnetometry, field-angle dependent specific heat and scanning tunneling microscopy (STM). The project involves magnetic and transport measurements at low-temperatures and high-magnetic fields, as well as the construction of a specific heat cell that can rotate in the magnetic field. The PhD project will be carried out in the Quantum Matter Amsterdam group at the Institute of Physics of the University of Amsterdam. The low temperature equipment includes a PPMS (Quantum Design), a Heliox Helium-3 refrigerator and a Kelvinox MX100 dilution refrigerator (both Oxford Instruments). The Institute has excellent equipment for the preparation of single-crystalline samples and their characterization. Low temperature STM experiments will be performed in-house, as well as in the LT-Scanning Probe Microscope at Leiden University.

Requirements

We seek a highly motivated student with excellent experimental skills and a strong interest in condensed matter physics. The candidate should hold a Masters degree (or equivalent) in experimental physics.

Further information

For information please contact/check:

[dr A. de Visser](#)
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[website dr De Visser](#)

Appointment

The appointment will be on a temporary basis for a period of 4 years (initial appointment will be for a period of 18 months and after satisfactory evaluation it can be extended for a total duration of 4 years) and should lead to a dissertation (PhD thesis). An educational plan will be drafted that includes attendance of courses and (international) meetings. The PhD candidate is also expected to assist in teaching of undergraduates.

Based on a full-time appointment (38 hours per week) the gross monthly salary will range from €2,222 in the first year to €2,840 in the last year. The [Collective Labour Agreement \(CAO\) for Dutch Universities](#) is applicable.

Job application

Please apply using the link below. All applications should include a:

curriculum vitae;
list of university courses taken with grades;
single page maximum statement of motivation and research interests.

An interview and a scientific presentation will be part of the selection process.

Tentative Submission Deadline : 1 January 2018

[Further Information](#)