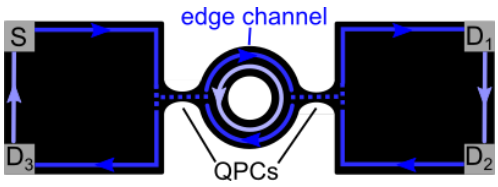
Paul-Drude-Institut für Festkörperelektronik

Leibniz Gemeinschaft

The Paul Drude Institute (PDI) performs basic research as a lively symbiosis of materials science and solid state physics. Our activities aim at inspiring and demonstrating new functionalities for future information technologies. As a member of the Leibniz-Gemeinschaft and Forschungsverbund Berlin e. V., we are an independent research institute with about 100 employees and collaborate with all three universities in Berlin. We are located in the very heart of the city near the Gendarmenmarkt. You may find more details at www.pdi-berlin.de.

PhD Position for Quantum Switches (m/f/d)

The quantum Hall effect is well known for the extremely precise resistance standard that it provides. In addition, the quantum Hall edge channels (QHECs) are perfect one-dimensional conductors, which can be used for ballistic electron transport. We offer a PhD position for studying coherent transport in QHECs with the goal to realize phase switches for on-chip quantum technology applications. The switches will be based on the Aharonov-Bohm effect in high magnetic fields.



The figure sketches the basic idea of a phase switch. A two-dimensional electron system is shown in black. In a perpendicular magnetic field, QHECs carry a chiral current along its edge (blue, electrons move in direction of arrows). A negative voltage is applied to the source contact (S), while the three drain contacts ($D_{1,2,3}$) are grounded. Two tunable quantum point contacts split the edge channels and separate a closed region from the leads. The distribution of the current into the three drain contacts depends on the controllable phase that electrons accumulate within the closed circle between the quantum point contacts. This idea may be expanded to study more complex switches.

Are you enthusiastic to work on your individual project embedded in a professional team and to perform challenging experiments in a complex laboratory environment? Are you eager to learn state-of-the-art nanolithography and quantum transport measurements at cryogenic temperatures or have already related experience? Do you have a solid background in basic quantum mechanics and condensed matter physics? Then you will enjoy working in our growing team and should apply for a personal interview.

The position is available for 3 years and requires a master in physics or a related area. Payment is according to TVöD (Treaty for German public service). The Paul Drude Institute aims at increasing the quota of female employees. The application of women is therefore encouraged. Among equally qualified applicants, preference will be given to disabled candidates.

Applications including a motivation letter and two references should be sent by J**une 14th, 2020**, to:
Herrn Andreas Hartung, Paul-Drude-Institut für Festkörperelektronik,
Leibniz-Institut im Forschungsverbund Berlin e. V.,
Hausvogteiplatz 5–7, 10117 Berlin, Email: jobs@pdi-berlin.de.

Zertifikat seit 2012 audit berufundfamilie

For scientific or technical questions related to the project, please contact PD Dr. Stefan Ludwig, Email: ludwig@pdi-berlin.de.