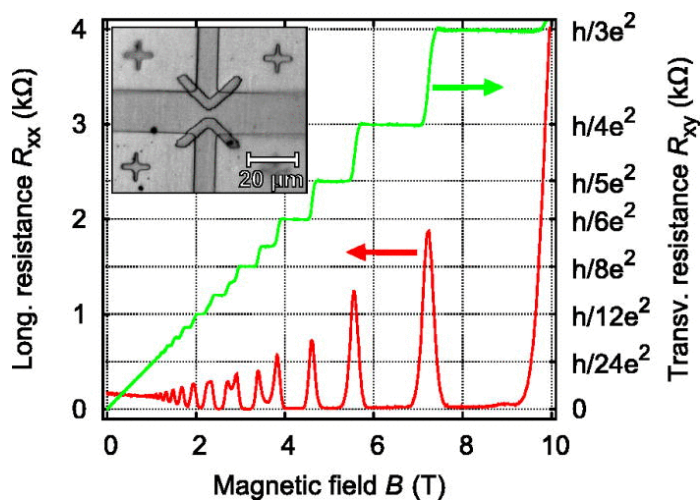


## Electrical and THz magnetospectroscopy studies of laser-patterned micro- and nanostructures on InAs-based heterostructures

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### Short Abstract

Nanostructures fabricated from narrow-gap semiconductors with strong spin-orbit interaction (SOI), such as InAs, can be used to filter momentum modes of electrons and offer the possibility to create and detect spin-polarised currents entirely by electric fields. Here, we present magnetotransport and THz magnetospectroscopy investigations of Hall-bars with back-gates made from in InGaAs/InAlAs quantum well structures. We demonstrate that quasi-one-dimensional channels can be formed by micro-laser lithography. Contrary to previous reports symmetric and asymmetric in-plane gate voltages applied to quasi-one dimensional channels did not show indications of SOI-induced anomalies in the conductance.



**Above.** Low-temperature magnetotransport measurements of Hall-bar HB1, after illumination with an infrared light-emitting diode. The inset shows a confocal microscopy image of sample QPC1. The dark grey areas are the mesa; the two V-shaped marks are the etched trenches that form the constriction of the QPC (quantum point contact).