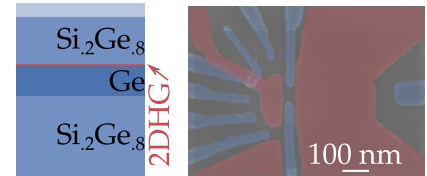


PhD Position on Ge Spin Qubits

Quantum electron devices @ University of Basel

March 23, 2022

We, the Quantum Electron Devices group at University of Basel, are currently looking for an excellent PhD student to join our team working on spin qubits in [planar Ge/SiGe heterostructures](#). As shown in the left panel of the figure, this material system consists of a Ge quantum well sandwiched between SiGe barriers. Applying electric fields from the top induces a two-dimensional hole gas (2DHG) at the top Ge/SiGe interface. The states of interest are valence band states, i.e. heavy-holes and light-holes, and they have long elastic mean free paths up to several micrometers. We confine these states into zero dimensions, to form a quantum dot with a charge sensor as shown on the right side of the figure, and we use the spin of a single hole to encode a qubit.



Your profile

If research on spin qubits sparks your interest, you are thirsty for knowledge, and you cannot wait to start experimenting, you already bring some important qualifications. Additionally, you need a Master's degree covering a solid background in quantum and solid state physics. Preferably you have already carried out some experimental work on semiconductor physics.

What we offer

We are a young research group setting up our experiments with Ge/SiGe heterostructures, a material which has emerged only recently but is a promising candidate for a host of a future quantum computer. Our interest lies in understanding the physical phenomena this material system provides us with, and in exploiting its high quality to build devices for studying quantum physics. You will learn how to build qubits and manipulate them with RF pulses at temperatures of 10 mK.

We collaborate with many groups at the University of Basel, in experiments and theory. Apart from constituting a large pool of knowledge, these interactions also create a lively atmosphere. Our research is embedded in a nation-wide effort on building spin qubits, the [NCCR SPIN](#), allowing for further collaborations and exchanges.

As a PhD student at University of Basel, you can profit from the [QCQT PhD school](#), which offers a wide range of courses and activities, to build up a network and develop important hard and soft skills.

How to apply

Please send the following documents to [Andrea Hofmann](#):

- Your CV including contact details of one to three referees
- A list of courses with grades from your Bachelor's and Master's degree
- Your Master's thesis