Masters Student Projects:
Silicon Spin Qubits
at the Center for Quantum Devices

Recent advances in fabricating spin qubits in silicon-based materials have moved this platform to the forefront of solid-state quantum computation. Silicon provides an environment free of *nuclear* spins (allowing long coherence times for *electron* spins) and is compatibility with industrial CMOS technology.

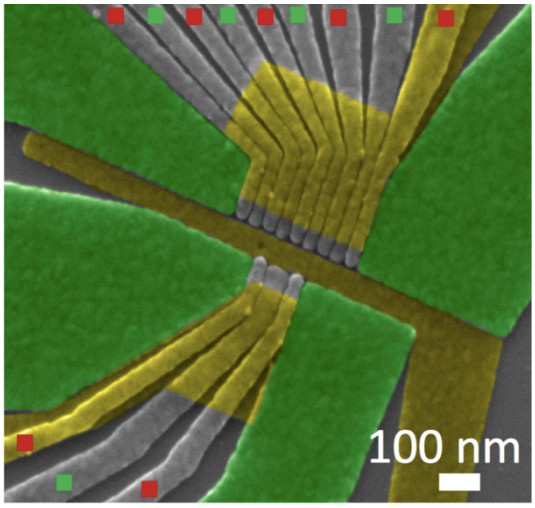

Figure: Fabio Ansaloni

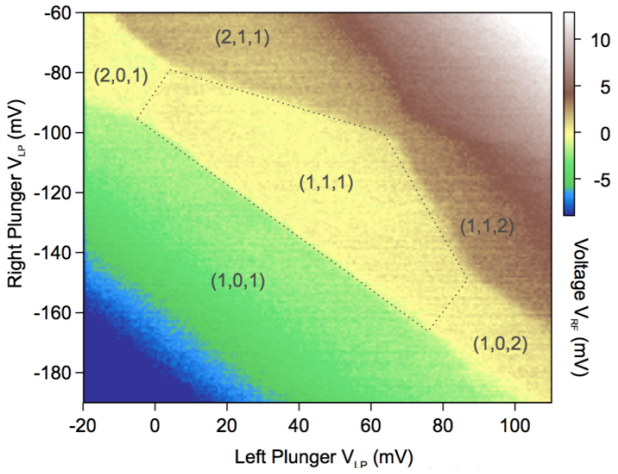

Image: Christian Volk

Our spin qubit team fabricates Si/SiGe heterostructure quantum dot devices to study double and triple quantum dots as spin qubits, with the goal of demonstrating short range two-qubit gates in scalable geometries. We also study quantum dots fabricated in industrial foundries, with fully compatible 300mm CMOS technology to test fast, scalable spin qubit platforms. Some exciting projects for masters students in this fast-moving field are:

- Development of high-inductance superconducting resonators for long-range coupling of silicon spin qubits.
- Cryogenic characterization of switch arrays and multiplexers for large-scale sample screening.
- Spin qubits in InAs nanowires (with superconducting shells) and the operation of nanowire double dots as nanoscale thermometers (with applications in thermoelectric studies of unconventional superconductivity).

If you are interested in these or other projects of the spin qubit team, please contact Ferdinand Kuemmeth (kuemmeth@nbi.dk).