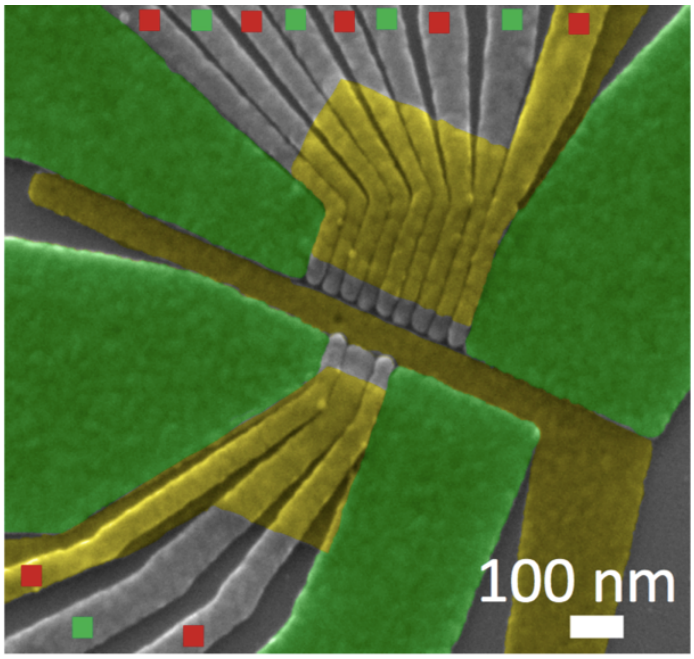
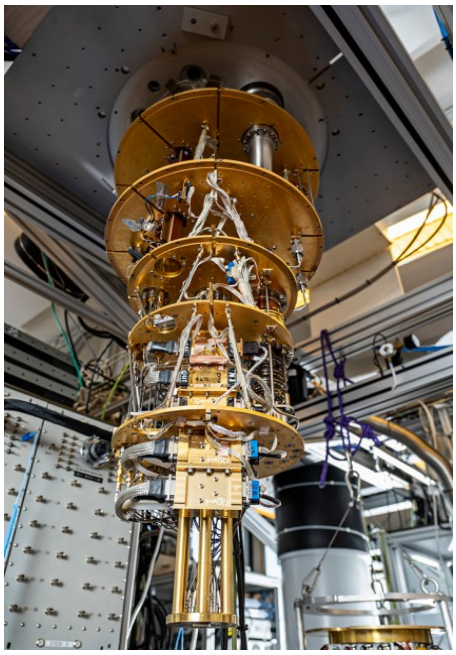
Master (or Bachelor) Project at Center for Quantum Devices

High-fidelity spin qubits in purified ^{28}Si

Recent advances in fabricating spin qubits in silicon-based materials have moved this platform to the forefront of solid-state quantum computation. The isotopically purified silicon-28 provides an environment free of *nuclear* spins (allowing long coherence times for *electron* spins) and compatibility with industrial complementary metal-oxide semiconductor (CMOS) technology.



Device fabricated in NBI's cleanroom (Fabio Ansaloni)



Dilution refrigerator for spin qubits (C. Andersen).

Our spin qubit team fabricates gate-controlled quantum-dot devices in Si/SiGe heterostructures to coherently control spin qubits, with the goal of demonstrating different types of qubit-qubit couplings in scalable geometries. We are looking for highly motivated and independent students with great communication skills, laboratory enthusiasm, and strong background in quantum physics. A project in our group entails:

- Design and nanofabrication of high-fidelty spin qubit devices.
- Cryogenic characterization and measurement of spin qubits arrays using state of the art equipment.
- Working in an international team and lab environment towards achieving long spin coherence times.

If you are interested in these or other projects related to spin qubits, contact
Ferdinand Kuemmeth (kuemmeth@nbi.dk) or
Anasua Chatterjee (anasua.chatterjee@nbi.ku.dk).

See all QDev student projects here: