

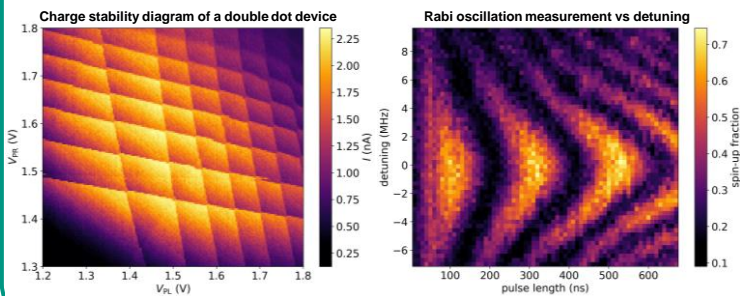
Semiconductor Spin Qubits

From Characterization to Quantum Sensing

AG Wernsdorfer's Efforts

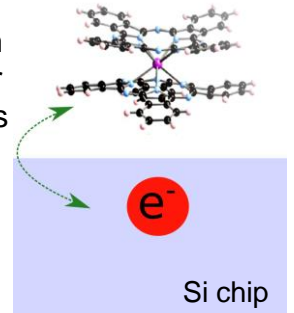
Qubit Operation

We characterize and manipulate state of the art Si/SiGe or SiMOS qubit devices. These devices are professionally manufactured by our industry collaborator imec (Interuniversity Microelectronics Centre, Belgium) and academic partner RWTH Aachen (Bluhm group).



Quantum Sensing

Single molecule magnets (SMMs) provide a great potential for the implementation of d-dimensional quantum digits (qudits). For application magnetic ion centers are embedded in an organic ligand shell. For readout the SMMs are coupled to an electron on a quantum dot formed in a two-dimensional quantum well inside a semiconductor hetero-structure. The chip is placed in a home-built dilution cryostat at 25mK.



Project Goals

We currently research on two projects:

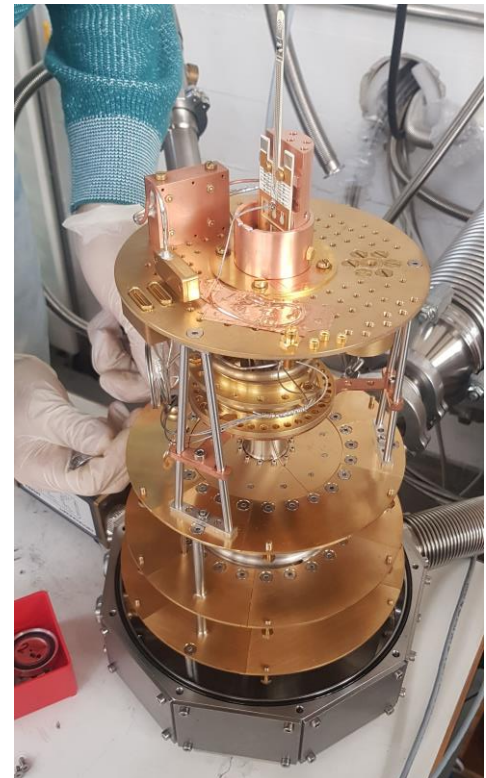
- The first project focusses on the characterization of industrially manufactured qubits, which involves the evaluation of new Si qubit chips layouts in terms of stability, manipulation and qubit operations.
- The second project concentrates on pushing forward quantum sensing of molecular qudits. Here the step from ensemble measurements to single molecules is a major goal.

Both projects require hands-on work with the cryostat and measurement setup.

Profile

Candidates must have (or soon obtain) a master degree in Physics. You should have interest in performing original research with the ability to work both independently and as a team player. Integrating and training Bachelor's and Master's students is encouraged. Researchers get a status as scientific employee with a salary according to 75% TV-L E13 as a PhD candidate or 100% TV-L E13 as a Postdoc.

Home-built Cryostat @25mK



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