



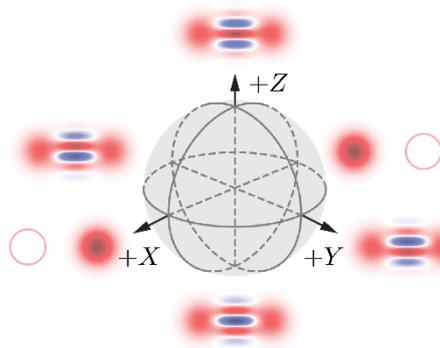
PhD position in bosonic quantum error correction with superconducting circuits

Alexander Grimm (Paul Scherrer Institut) & Christoph Bruder (Universität Basel)

Deadline: December 31st, 2021

Location: Villigen, Switzerland

We are looking for a PhD student for a joint research activity between the Quantum Technologies Group at the Paul Scherrer Institut (<https://www.psi.ch/en/lmn/bosonic-quantum-error-correction-with-superconducting-circuits>) and the Quantum Theory Bruder Group at the University of Basel (<https://quantumtheory-bruder.physik.unibas.ch/en/>). The student will moreover become a member of the Swiss Nanoscience Institute (SNI) PhD school. The position will start after January 1st 2022.



In our research, we will develop new ways to store and manipulate quantum information in nonlinear superconducting oscillators. A key element of our work will be to make use of the many energy levels present in these oscillators to encode qubits that are intrinsically protected against errors. Part of our work will be to devise and implement new nanofabrication processes for superconducting circuits compatible with bosonic quantum error correction. Our goal is to explore both the promise of this approach for quantum computation and simulation, as well as its fundamental aspects in the context of out-of-equilibrium physics.

We are currently looking for a motivated student with experience or interest in circuit QED, nanofabrication, and nonlinear quantum optics. Over the course of the project she/he will acquire a wide range of experimental skills including:

- Cryogenics and operation of dilution refrigerators
- Microwave circuit design
- Nanofabrication and characterization (lithography, growth and deposition, SEM, AFM, etc.)
- Experimental control and data analysis software
- Quantum measurement and control techniques



In addition, the student will participate in the theoretical developments associated with the project. The successful candidate should have good English language skills and a solid background in quantum mechanics. Prior experience in any of the techniques mentioned above is considered a plus. Interested candidates should send Alexander Grimm (alexander.grimm@psi.ch) a CV and briefly describe why you would like to work with us.