

# Dissipation and Decoherence in a Quantum System

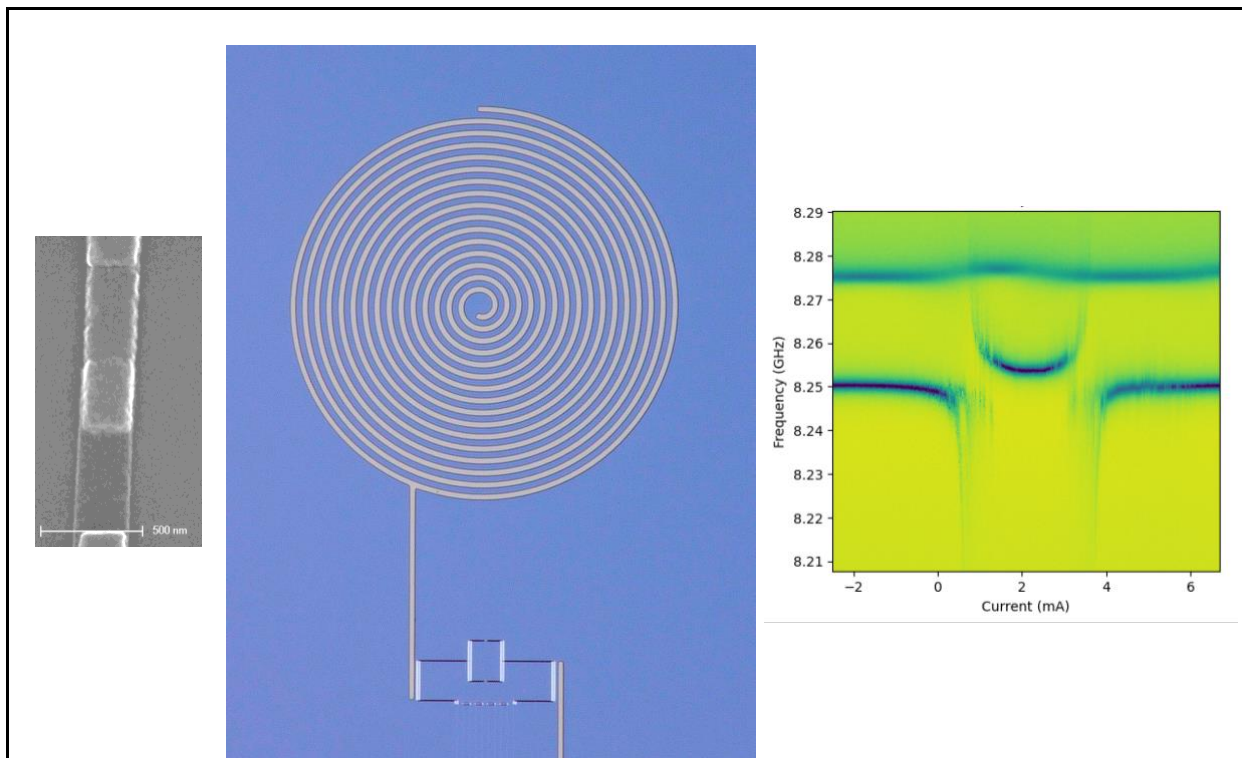
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What happens to the ground state of a quantum system when we add dissipation? How is the lifetime of excited states affected by dissipation? How is quantum coherence destroyed by dissipation?

The student will measure the lifetime and coherence of a bad qubit: a Josephson junction shunted by an on-chip resistance and embedded in a superconducting microwave cavity. The student is expected to aid in the design of devices using microwave simulation software; fabricate samples in a clean room using techniques such as microlithography and electron beam evaporation; cool samples using a cryogen free dilution cryostat; and make sensitive microwave measurements at low temperatures

**Methods and techniques: quantum mechanics, cryogenics, microwave electronics, microlithography**

**Possibility to go on with a PhD ? Yes**

**Envisaged fellowship ? No**