Double Quantum Dots in GaAs Coupled to a Surface Acoustic Wave Resonator

This project aims to implement and study double quantum dots (DQDs) in GaAs heterostructures coupled to a surface acoustic wave (SAW) resonator, with the goal of exploring coherent charge dynamics and phonon-electron interactions at the quantum level.

The project will involve nanofabrication of gate-defined quantum dots, integration with SAW resonators, and low-temperature transport and microwave measurements. The student will participate in the design and fabrication of high-frequency devices, tune and characterize double quantum dots, and investigate their coupling to propagating and resonant acoustic modes.

Through this work, the student will gain hands-on experience in semiconductor quantum dots, cryogenic measurements, RF techniques, and quantum coherent systems, as well as exposure to hybrid quantum platforms combining electronics and phononics. The project is well suited for students interested in solid-state quantum information and coherent control of mesoscopic systems.

Prior cleanroom and measurement experience during internships, master projects and block courses are appreciated.

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