

Novel qubits in hybrid semiconductor-superconductor nanostructures

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During the last few years, hybrid semiconductor-superconductor Josephson junctions are being explored for novel qubit applications [1,2]. In my talk I will focus on semiconducting quantum dot-based Josephson junction and will discuss various examples including: i) quantum dot-based superconducting spin qubits embedded in transmon circuits [3] and ii) the extension of this idea to Josephson junctions based on minimal Kitaev chains to implement a minimal Majorana-Transmon qubit [4]. Towards the end of the talk, I will also briefly discuss some of our work in progress which includes hole-based hybrids [5] and hybrid superconducting spin/fluxonium qubits based on quantum dot Josephson junctions.

References

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