Quantum Information and Computing
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1) Study the implementation of 1-qubit gates and 2-qubit gates with charge superconducting qubits (see for instance https://arxiv.org/abs/cond-mat/0311067 )

2) Following https://arxiv.org/abs/quant-ph/0611166 (and refs therein) develop a code to simulate the 2-qubit gate and quantify the accuracy of the gate without and with leakage current (optimized pulses are not necessary). Comment on the results also in view of https://arxiv.org/abs/cond-mat/9906292

3) Combine these gates to build the Deutsch algorithm at least in the case of 2 qubits. (https://arxiv.org/pdf/cond-mat/0105169.pdf )

By the due date please submit both the code and the presentation of the final project. The presentation has to cover the topics detailed above, including the theory part. There is no limit to the number of slides however, the final presentation should last 15+15 minutes.