

Quantum annealing and quantum simulation

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Using the quantum adiabatic approach one can bring a quantum system from an easy to prepare state towards the ground state of a complex system. It can be used both to solve classical optimization problems in a quantum annealer, when the final Hamiltonian is a classical model representing the optimization problem. Alternatively it can be used as a quantum simulator to find low energy states of quantum models. I will discuss both approaches in the context of superconducting qubit devices and ultracold atomic gases. I will assess their potential and limitations and will draw analogies to the history of classical computing.