

Introduction to quantum Monte Carlo methods

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In these lectures, I will focus on quantum Monte Carlo methods, an alternative to conventional electronic structure approaches, which provide a stochastic solution of the interacting many-electron Schroedinger equation. Quantum Monte Carlo techniques require a computing time that only scales algebraically as N^4 (or better) with the number of electrons, and have yielded accurate results for the correlated properties of large molecules and solids where conventional highly-correlated methods are extremely difficult to apply.