Advances in quantum chemistry simulation algorithms

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Within the last several years there have been major strides in quantum hardware that have made the promise of quantum computing much closer than anyone would have believed a mere 5 years ago. Similarly, quantum simulation algorithms have undergone a revolution. In this talk, I will provide an overview of quantum simulation algorithms as well as some of the major developments that have caused the cost of quantum simulation to be reduced by a factor of roughly 10 Billion or more. In particular, I will review recent algorithmic developments including interaction picture simulation methods, improved methods for Trotter-Suzuki simulations and stochastic integrator techniques and discuss how these techniques can be used to further reduce the cost of quantum chemistry simulation.