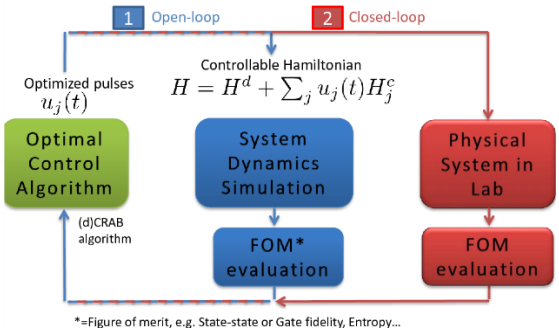
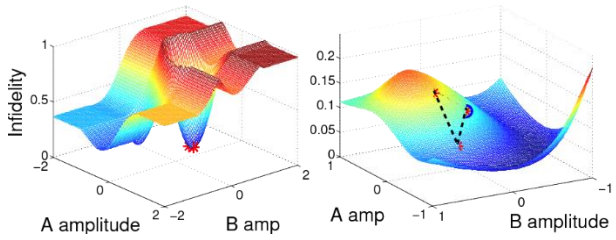
Speaker: Jonathan Zoller, Institute for Complex Quantum Systems and IQST, Ulm University

Time and place: Monday 12 September, 10:00 in 1525-626 (coffee/tea and cake from 09:45)

Quantum Optimal Control:

An introduction & closed loop application





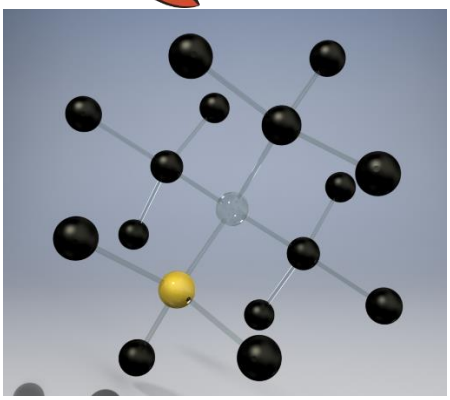


Image lower left with kind approval of Florian Frank, ulm university

Abstract: Quantum optimal control is at the heart of present and future quantum technologies. At ulm university, theorists and experimentalists work closely together in pushing forward the barriers to pave the way for everyday applications. We are happy that we could lately strengthen our collaboration with Aarhus university to jointly work on this emerging field. The Institute for Complex Quantum Systems (led by T. Callarco) contributes by providing optimized pulses, i.e. time-dependent electro-magnetic fields to fulfill various control tasks such as entanglement generation, gate fidelity maximization or observable control. Moreover, we have developed a closed-loop optimal control suite capable of controlling many types of atomic, quantum and molecular systems. We will present this tool along with some successful application in single spin control in diamond and also give a brief introduction to optimal control theory.