

## Abstract:

Ultracold atoms constitute a system to investigate non-equilibrium physics in strongly correlated systems. Their good tunability allows to rapidly change the system parameters and observe the subsequent quantum evolution. For example the non-adiabatic dynamics across the superfluid-Mott-insulating phase transition has been realized in ultracold bosonic gases confined to optical lattices. The theoretical description of these time-dependent phenomena is very involved. We apply the recently developed adaptive time-dependent DMRG method to study the response of these strongly correlated quantum systems to different parameter changes.