

DISENTANGLING STRONGLY CORRELATED QUANTUM SYSTEMS

In this talk I will review the new perspectives on the density-matrix renormalization group algorithm that have emerged from quantum information theory, and also led to new algorithmic proposals, e.g. for the simulation of time-dependent strongly correlated quantum systems. I will illustrate these new developments by several applications, mainly from the field of ultracold atoms in optical lattices, and give an outlook on new developments currently in the "test phase" - finite temperature dynamics and impurity systems.