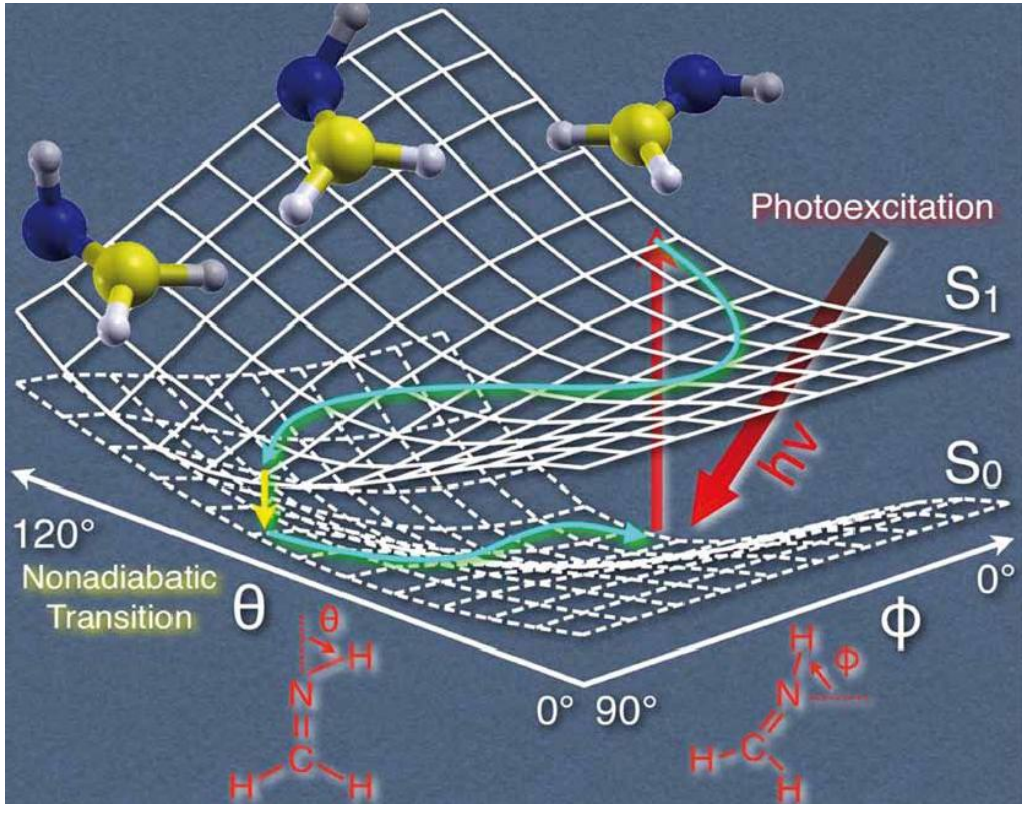
Time evolution of quantum many-body systems

The way electrons move and interact with each other has a dramatic effect on a variety of quantum processes, including chemical reactions, molecule-laser interactions, and molecular adsorption on metal surfaces. In most interesting quantum systems, it is not possible to solve the Schrödinger equation numerically, because the wavefunction becomes a more and more complicated object as the number of electrons is increased. Most present-day investigations follow a simpler approach, called *density functional theory*, where one solves for the electron density.

Density functional theory has become a very popular approach. However, it has problems in some of the most interesting cases, such as the breaking of a chemical bond and electron transfer processes. To solve these problems, a generalization of density functional theory, called *reduced density matrix functional theory*, has been introduced.

Diploma projects are available in the development and application of reduced density matrix functional theory. Interested persons may contact Prof. Oleg Pankratov (oleg.pankratov@physik.uni-erlangen.de).



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