



## PD Dr. Frank Grossmann

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### Semiclassical dynamics of dissipative quantum systems

The time-dependent semiclassical initial value formalism to solve the Schroedinger equation will be reviewed.

In order to treat system-bath type Hamiltonians two complementary strategies are then introduced and discussed:

(i) A semiclassical hybrid approach for systems with a finite number of degrees of freedom is used to study decoherence effects due to the interaction of an anharmonic molecular vibration with an oscillator bath. The emergence of Schroedinger cat states in the  $I_2Kr_x$  system will be discussed.

(ii) In the path integral language, the coupling to an infinite bath of harmonic oscillators leads to the Feynman-Vernon influence functional. The memory-free unraveling of this functional by Stockburger and Grabert is implemented using the Herman-Kluk semiclassical initial value representation and it is shown that dynamical simulations of thermalization are possible.

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