Földi Péter: Light-controlled currents in solid state systems

In the first part of the talk, a method based on time-dependent nonequilibrium Green's functions (TDNEGF) is introduced, which provides a flexible, effective tool for the description of quantum mechanical single particle scattering on a spatially localized, time-dependent potential. This formalism can be applied directly to the description of transport phenomena in solids under the influence of time-dependent external fields. In the second part of the talk examples are shown where fast oscillating (optical) fields influence the current flowing through nanoscale solid state systems. As a generalization of the model, it is shown that the spin degree of freedom can also be manipulated by time-dependent external perturbations.