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ARNOLD SOMMERFELD  
CENTER FOR THEORETICAL PHYSICS



# Arnold Sommerfeld Lecture Series

Professor Christopher Jarzynski  
University of Maryland, USA

Statistical Physics Seminar:

## Quantum Impulse Control

The quantum adiabatic theorem governs the evolution of a wavefunction under a slowly time-varying Hamiltonian. I will consider the opposite limit of a Hamiltonian that is varied impulsively: a strong perturbation  $U(x,t)$  is applied over a time interval of infinitesimal duration  $\epsilon \rightarrow 0$ . When the strength of the perturbation scales like  $1/\epsilon^2$ , there emerges an interesting dynamical behavior characterized by an abrupt displacement of the wave function in coordinate space. I will solve for the evolution of the wavefunction in this situation. Remarkably, the solution involves a purely classical construction, yet describes the quantum evolution exactly, rather than approximately. I will use these results to show how appropriately tailored impulses can be used to control the behavior of a quantum wavefunction.

Thursday, November 21, 2019, 4.15pm, Room A348, Theresienstr. 37, LMU