# Fermi Golden Rule
# in Quantum Statistical Mechanics

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**Abstract.** The mathematical foundations of time-dependent perturbation theory were laid down by Barry Simon in his seminal 1973 Annals paper. In this talk I will discuss the time-dependent perturbation theory and Fermi Golden Rule in the context of quantum statistical mechanics. The talk will be of a review nature and I will focus on the historical aspects as well as the applications to the problem of return to equilibrium (zeroth law of thermodynamics). This talk is based on joint work with C.-A. Pillet.