

CM / AMO Seminar

← Condensed Matter & Atomic Molecular Optical →

Thursday, October 24, 2019 / 800 Pupin Hall Thoeny Center / 12:00 PM

“Non-Equilibrium Control of Quantum Systems”

One of the most fascinating aspects of non-equilibrium physics is that a macroscopic quantum system pushed out of equilibrium can in principle exhibit markedly different dynamics when probed on different time scales. Pioneered in ultracold atoms and solid-state systems, the idea to use external driving such as strong optical pulses consequently holds promise to exceed the limitations set by chemistry and push materials into non equilibrium states with novel or useful properties.

This talk will discuss how tailored light pulses can provide a handle to control, manipulate or induce new electronic or magnetic phases in interacting electron systems and quantum magnets. I will argue that symmetry considerations in driven systems could yield generic guiding principles that determine the non-equilibrium state and are robust to microscopic details. I will then discuss a unitary renormalization flow for non-integrable periodically-driven quantum systems, in which distinct dynamical regimes are captured via a series of avoided fixed points and a rigorous correspondence between “flow time” and real time can be established.

Martin Claassen, Flatiron Institute

