Seminar/Talk

Creating new non-equilibrium phases of matter by "polyfractal" driving

Kartiek Agarwal
McGill University

Host: Maksym Serbyn

We propose a new protocol for engineering quantum many-body Hamiltonians with enhanced symmetries. The protocol is based on repeated pulsed application of a set of unitary operators Xi, with X2i=1, (which can be generalizedto Xn=1,n>2) in a self-similar-in-time ("polyfractal) manner. For local initial Hamiltonians, the protocol can simultaneously implement multiple global and local symmetries, with the accuracy improving superpolynomially with the fastest drive period. The effective Hamiltonian remains local and avoids heating over time scales that are stretched-exponentially long in the drive frequency. Such Floquet engineering can be used to realize novel non-equilibrium quantum phases. We also discuss how our protocol can be implemented robustly using a setup based on Majorana fermions. Networks of such Majoranas can be used to implement novel symmetry-protected topological phases, lattice gauge theories, among others.

Monday, June 24, 2019 11:00am - 12:00pm
Big Seminar room Ground floor / Office Bldg West (I21.EG.101)

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