PHYSICAL MATHEMATICS SEMINAR

Shortcuts to adiabaticity

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ABSTRACT:

Shortcuts to adiabaticity (STA) are fast non-adiabatic processes in classical and quantum systems providing an alternative to adiabatic slow driving, e.g., in the preparation of a target state. I will introduce a universal framework to design STA protocols and report on recent progress in systems with a dynamical symmetry. As an application, I will discuss the nonadiabatic control of trapped ultracold atomic gases in the laboratory, where the interatomic interactions can be tuned from zero to the strongly-coupled regime. Another promising application is the use of STA to drive a quantum phase transition in finite-time, while suppressing the formation of excitations dictated by the Kibble-Zurek mechanism. I will close assessing the cost of implementing STA protocols.

TUESDAY, OCTOBER 17, 2017
2:30 PM
Building 2, Room 142

Reception following in Building 2, Room 290
(Math Dept. Common Room)

http://math.mit.edu/seminars/pms/

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