

**Joint CMP/CORE-CM Seminar  
Michigan State University**

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***How can we understand non-equilibrium many-body states?***

Many-body systems with both coherent dynamics and dissipation constitute a rich class of models which are nevertheless much less explored than their dissipationless counterparts. The advent of numerous experimental platforms that simulate such dynamics poses an immediate challenge to systematically understand and classify these models. In particular, nontrivial many-body states emerge as steady states under non-equilibrium dynamics. In this talk, I use a systematic approach based on the Keldysh formalism to study nonequilibrium phases and phase transitions in such models. I show that an effective thermal behavior generically emerges as a result of dissipation, and the universal behavior including the dynamics near the steady state is described by a universality class in equilibrium thermodynamics. In the end, I will also discuss possibilities that go beyond the paradigm of an effective thermal behavior.

**Thursday, February 18, 2016  
12:00 p.m.  
BPS 1400  
Prof. Carlo Piermarocchi - Host**