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How should we understand non-equilibrium many-body steady states? MOHAMMAD MAGHREBI, ALEXEY GORSHKOV, University of Maryland — : 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 field-theoretic approach based on the Keldysh formalism to study nonequilibrium phases and phase transitions in such models. I show that an effective temperature generically emerges as a result of dissipation, and the universal behavior including the dynamics near the steady state is described by a thermodynamic universality class. In the end, I will also discuss possibilities that go beyond the paradigm of an effective thermodynamic behavior.

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