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Introduction to dynamical quantum phase transitions

The theory of phase transitions plays a central role for the understanding of equilibrium physical systems. In this contribution I will introduce a dynamical analogue in quantum many-body systems, termed dynamical quantum phase transition, that occurs during coherent nonequilibrium real-time evolution. Starting from the general setting of nonequilibrium dynamics in closed quantum many-body systems, I will first give the general definition of dynamical quantum phase transitions as phase transitions in time, outline recent experimental observations, and will finally discuss the concept's implications and future prospects.