

Universality far from equilibrium. From similarity with one-self to many whirls in the ultracold

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Universality has become a central concept in physics, with its history spanning centuries. In equilibrium it serves, e.g., the purpose of classifying a wide range of different critical phenomena into a small number of types characterized by specific symmetries, which we connect with both mathematical rigor and unspoilt beauty. In isolated time-evolving systems far from equilibrium it is much less clear what such classification could be like. In this colloquium I will introduce to some examples of far-from-equilibrium and universal dynamics, highlight key mechanisms and difficulties in describing them and provide a little background on experimental examples involving cold atomic quantum gases and beyond.