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Universal Dynamics near Non-Thermal Fixed Points

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Quenched or continuously driven quantum systems can show universal dynamics near non-thermal fixed points, generically in the form of scaling behaviour in space and time. Systems where such fixed points can be realized encompass post-inflationary evolution of the early universe, cold dark matter, dense neutron stars, heavy-ion collisions, to low-energy dynamics in cold gases. Key aspects of the theory of non-thermal fixed points will be briefly summarized [1,2], as well as recent experimental results for quenched systems [3,4]. Considering scaling transport of excitations to larger wave numbers similar to an inverse cascade, the underlying excitations can be either irregular phase excitations or (quasi) topological defects [5] exhibiting implications for quantum turbulence.

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