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Non-Equilibrium Dynamics of a Mobile Impurity in a One-Dimensional Quantum Gas

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Abstract:

In this talk I will review some recent developments in the physics of the motion of a mobile impurity in a one-dimensional quantum gas focusing on the phenomena of steady frictionless motion, quantum flutter and quasi-Bloch oscillations. I will then consider an exactly solvable corner of the parameter space to give a simple physical picture of the key phenomena exhibited by the system as well as giving a complete quantitative theory of the system's dynamics.