

Workshop in Stochastic Analysis and Applications

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Towards unification of (relativistic) hydrodynamics and statistical mechanics

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Abstract

I briefly introduce recent experimental results of hydrodynamics in small systems, mainly heavy ion collisions but also ultracold atoms, and argue that they force us to rethink of what "hydrodynamics" means and how it emerges as an effective theory of strongly interacting systems of many particles. I introduce current approaches in this direction, and argue that thermodynamic fluctuations might be crucial in determining when hydrodynamics becomes a good effective description.

Based on

<https://arxiv.org/abs/2109.06389>

<https://arxiv.org/abs/2007.09224>