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Forum de Physique Statistique @ ENS

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Domaines : cond-mat.stat-mech

Titre : *Quantum Generalized Hydrodynamics*

Orateur : **Paola Ruggiero**

Résumé : *Even though open problems still survive, today we can safely assert that we know how to deal with 1D quantum many-body uniform systems, with a large number of well developed and established tools available. Much less is instead understood for inhomogeneous systems, both in and out of equilibrium. Recently, different approaches have been introduced to tackle such systems. On one side, the so-called generalized hydrodynamics (GHD) for integrable models [1, 2]. On the other, it was also understood that conformal field theory (CFT) methods can be extended to deal with inhomogeneous situations at the price of working in a curved background [3, 4]. In this seminar, after introducing the main ideas behind GHD and CFT for inhomogeneous systems, I am going to present the result of our the attempts to merge GHD with ideas coming from CFT in curved backgrounds, namely the theory of Quantum Generalized Hydrodynamics (QGHD) [5]. QGHD is a theory of quantum fluctuations on top of GHD. It can be viewed as a multicomponent Luttinger liquid theory, describing quantum fluctuations of truly nonequilibrium systems where conventional Luttinger liquid theory fails.*

References : [1] B. Bertini, M. Collura, J. De Nardis, M. Fagotti, Phys. Rev. Lett. 117, 207201. [2] O. A. Castro-Alvaredo, B. Doyon, T. Yoshimura, Phys. Rev. X 6, 041065 [3] J. Dubail, J.-M. Stéphan, J. Viti, P. Calabrese, SciPost Phys. 2, 002 (2017) [4] P. Ruggiero, Y. Brun, J. Dubail, SciPost Phys. 6, 051 (2019) [5] P. Ruggiero, P. Calabrese, B. Doyon, J. Dubail, Phys. Rev. Lett. 124, 140603 (2020).