SEMPARIS – Séminaires en région parisienne

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Seminaire exceptionnel

Vendredi 10 Décembre 2021, 11 :00
CPHT, Louis Michel
Domaines : hep-th

Titre : *(Pseudo)-Spontaneous U(1) Symmetry Breaking in Hydrodynamics and Holography*

Orateur : **Sebastian Grieninger (IFT Madrid)**

Résumé : *We investigate the low-energy dynamics of systems with (pseudo)-spontaneously broken U(1) symmetry. First, we consider the purely spontaneous case which corresponds to a superfluid where we compute the support of the hydrodynamic modes on the different field theory operators across the phase diagram. In the pseudo-spontaneous case, we construct a hydrodynamic framework and consider two generalizations of the standard holographic superfluid model to incorporate explicit breaking. In all cases, we find agreement between hydrodynamics and holography. Furthermore, we verify that phase relaxation arises only due to the breaking of the inherent Goldstone shift symmetry. The interplay of a weak explicit breaking of the U(1) and phase relaxation renders the DC electric conductivity finite but does not result in a Drude-like peak. In this scenario we show the validity of a universal relation between the phase relaxation rate, the mass of the pseudo-Goldstone and the Goldstone diffusivity.*
