SEMPARIS – Séminaires en région parisienne

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Seminaire exceptionnel

Lundi 16 Mai 2022, 11 :00
CPHT, Salle Louis Michel
Domaines : hep-th

Titre : *Univalence bounds on transport and effective field theories*

Orateur : **Saso Grozdanov (University of Edinburgh)**

Résumé : *Bounds on transport represent a way of understanding allowable regimes of quantum and classical dynamics. Numerous such bounds have been proposed, either for classes of theories or (by using general heuristic arguments) universally for all theories. Few are exact and inviolable. In this talk, I will present new methods for deriving exact, rigorous, and sharp bounds on all coefficients of hydrodynamic dispersion relations, including diffusivity and the speed of sound. These general techniques combine analytic properties of hydrodynamics and the theory of univalent (complex holomorphic and injective) functions. Concrete examples will include bounds that relate transport to quantum chaos through 'pole-skipping' as well as bounds without relation to chaos, such as the conformal bound on the speed of sound. I will also outline a set of general observations regarding the univalence properties of diffusion and sound in holographic models. Finally, I will discuss how these ideas could be generally applicable to constraining any effective field theory, not only hydrodynamics.*