Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

Jeudi 3 Octobre 2019, 11:40

Daniel Arean

IFT Madrid

Hydrodynamics of density waves from holography

I will describe how an effective hydrodynamic theory describing systems at finite charge density and nonzero temperature where translations are broken (pseudo-)spontaneously is realized holographically. New collective modes, the phonons, appear in the low energy spectrum, and their interaction with the charge and energy fluctuations are captured by new diffusive transport coefficients. These diffusivities can be computed from radially conserved bulk currents of the dual black hole geometry. When translations are also weakly broken a universal relaxation mechanism of the pinned collective modes (pseudo-phonons) is found, whereby the ratio of the phonon damping rate and pinning frequency squared is set by one of the above mentioned diffusivities. The ac conductivity of the model features a rearrangement of spectral weight similar to that encountered in the strange metallic phase of the cuprate high temperature superconductors.

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