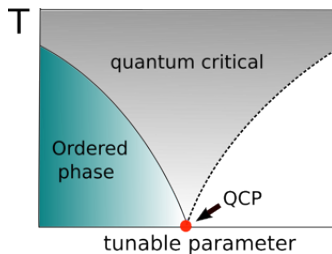


Iniziativa specifica SFT (Statistical Field Theory)

- ▶ Responsabile nazionale: Andrea Cappelletti (INFN).
- ▶ Responsabile locale: Nicodemo Magnoli (PA).
- ▶ Partecipanti: Nicola Maggiore (PA), Andrea Amoretti (D), Alessandro Braggio (Spin-CNR), Giacomo Caruso (D).
- ▶ Collaborazioni: Michele Caselle (Torino), Daniele Musso (ICTP), Ivan Levkivskyi (Ginevra), Matteo Baggioli (Barcellona).

AdS/CMT correspondence

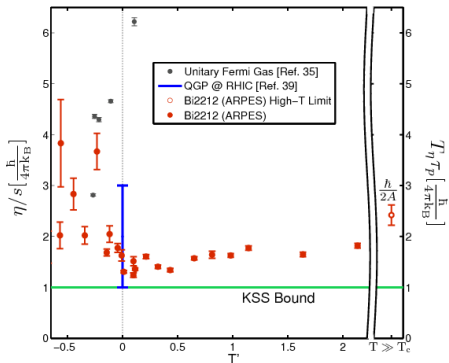
A. Amoretti, A. Braggio, N. Maggiore, N. Magnoli and D. Musso
JHEP 1401 (2014) 054, JHEP 1409 (2014) , Phys. Rev. D91
025002 (2015).



- ▶ Investigation of strongly correlated systems with momentum dissipation via AdS/CFT.
- ▶ Computation of transport coefficients near Quantum Critical Point (QCP).
- ▶ Possible application to graphene and cuprates.

Bound on viscosity

- ▶ QGP, Unitary Fermi gas, Arpes on optimally doped cuprates almost saturate the bound.



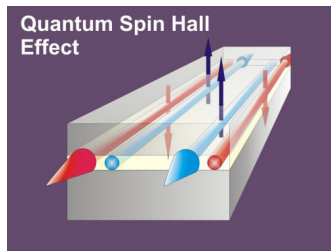
- ▶ Rameau et al. PRB '14

A. Amoretti, A. Braggio, N. Magnoli and D. Musso
JHEP (2015)

- ▶ Planckian bounds on diffusion constants in holographic models featuring momentum dissipation (Hartnoll).
- ▶ Linear in temperature resistivity and entropy density and constant electric susceptibility.
- ▶ Sum of the thermo-electric diffusion constants is bounded.

QFT with boundary

A. Amoretti, A. Braggio, N. Maggiore, N. Magnoli and G. Caruso
JHEP 1404 (2014) 142, Advances in High Energy Physics (2014),
Phys. Rev. D90, 125006 (2014).



- ▶ Investigation of Topological Quantum Field models in the presence of boundaries.
- ▶ Study of the dynamics on the boundary.
- ▶ Possible application to topological insulators.

Correlation functions in 3D Ising model

M. Caselle, G. Costagliola, N. Magnoli Phys. Rev. D91, 061901 (2015).

- ▶ Numerical evaluation of OPE coefficients in three dimensional Conformal Field Theories based on the study of the conformal perturbation of two point functions in the vicinity of the critical point (magnetic perturbation).
- ▶ Estimate for $C_{\sigma\sigma}^\epsilon$ agrees with those recently obtained using conformal bootstrap methods.

Future activities

- ▶ Investigation of strongly correlated systems with momentum dissipation and magnetic field via ADS/CFT.
- ▶ Metal-insulator transition via ADS/CFT.
- ▶ Study of the correlation functions of the 3D Ising model near the critical point (thermal perturbation).
- ▶ Study of transport properties of Luttinger liquids out of equilibrium.