

# Outline

SLIDES SFT  
2019

Nicodemo  
Magnoli

Conformal  
perturbation  
theory

Quantum field  
theory with  
boundaries

Hydrodynamic  
applied to  
systems with  
broken  
translational  
invariance

**1** Conformal perturbation theory

**2** Quantum field theory with boundaries

**3** Hydrodynamic applied to systems with broken translational invariance

## Participants

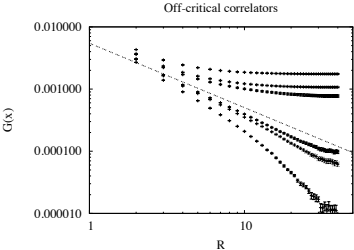
- Nicodemo Magnoli (responsabile locale)
- Nicola Maggiore
- Andrea Amoretti (RtDA)
- Daniel Brattan (Infn PostDoc)
- Marcello Scanavino (Dottorato)

- Nicodemo Magnoli, Marcello Scanavino
- We have studied the accuracy and predictive power of conformal perturbation theory by a comparison with lattice results in the neighbourhood of the finite-temperature deconfinement transition of  $SU(2)$  Yang-Mills theory, assuming that the infrared properties of this non-Abelian gauge theory near criticality can be described by the Ising model.

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- Nicola Maggiore
- Chern-Simons model
- A planar boundary in Chern-Simons models. Chiral current algebra on the boundary. Holographic two-dimensional reduction expressed in terms of a chiral scalar (2).
- The 3D Maxwell theory with single-sided planar boundary.
- As a consequence of the existence, on the boundary, of two Ward identities, we find two chiral conserved edge currents satisfying a Kaç–Moody algebra with central charge equal to the inverse of the Maxwell coupling constant (3).

- Andrea Amoretti, Daniel Brattan, Nicodemo Magnoli, Marcello Scanavino
- The research will be focalised on effective hydrodynamic theories for describing phases that spontaneously break translational symmetry.
- In condensed matter systems which do not present quasi-particles (as HTC superconductors), local thermalisation is fast because the only long-lived degrees of freedom are the conserved currents.
- This fact renders very useful the hydrodynamic approach in order to study the transport coefficients.

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- [2] N. Maggiore, “From Chern–Simons to Tomonaga–Luttinger” Int.J.Mod.Phys.A 33, no. 02, 1850013 (2018). doi:10.1142/S0217751X18500136
- [3] N. Maggiore, “Conserved chiral currents on the boundary of 3D Maxwell theory,” J. Phys. A **52** (2019) no.11, 115401 doi:10.1088/1751-8121/ab045a [arXiv:1902.01901 [hep-th]].
- [4] A. Amoretti, D. Areán, B. Goutéraux and D. Musso, “A holographic strange metal with slowly fluctuating translational order,” arXiv:1812.08118 [hep-th].
- [5] A. Amoretti, D. Areán, B. Goutéraux and D. Musso, “Diffusion and universal relaxation of holographic phonons,” arXiv:1904.11445 [hep-th].