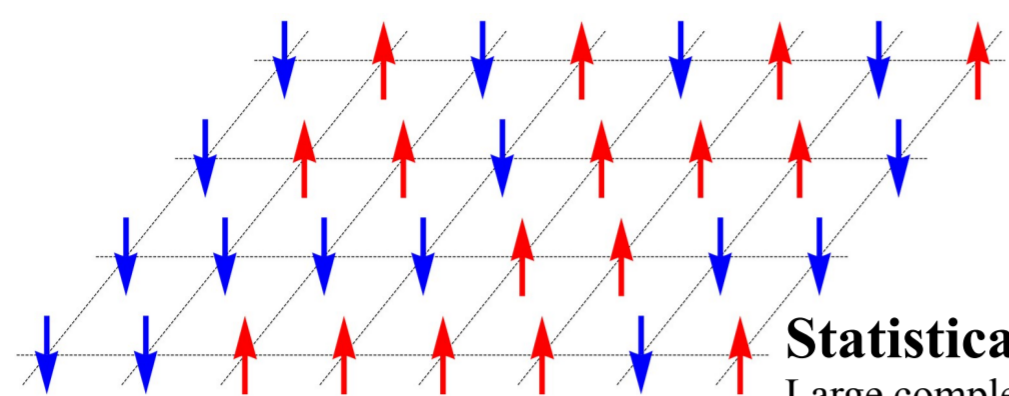


Chair for Theoretical Physics III

Black Holes, Quantum Information and Correlated Systems

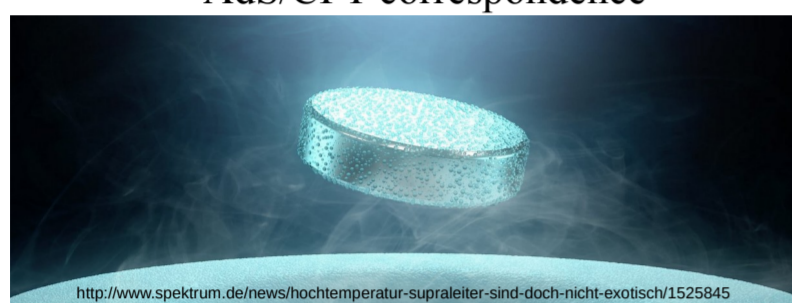


Statistical Physics

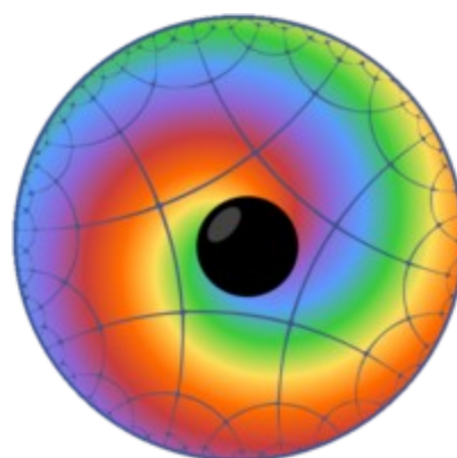
Large complex systems are made tractable using statistics and numerical methods

Strongly Correlated Electrons in Solid States

Strongly correlated phases of matter, such as superconductors, are described via the AdS/CFT correspondence

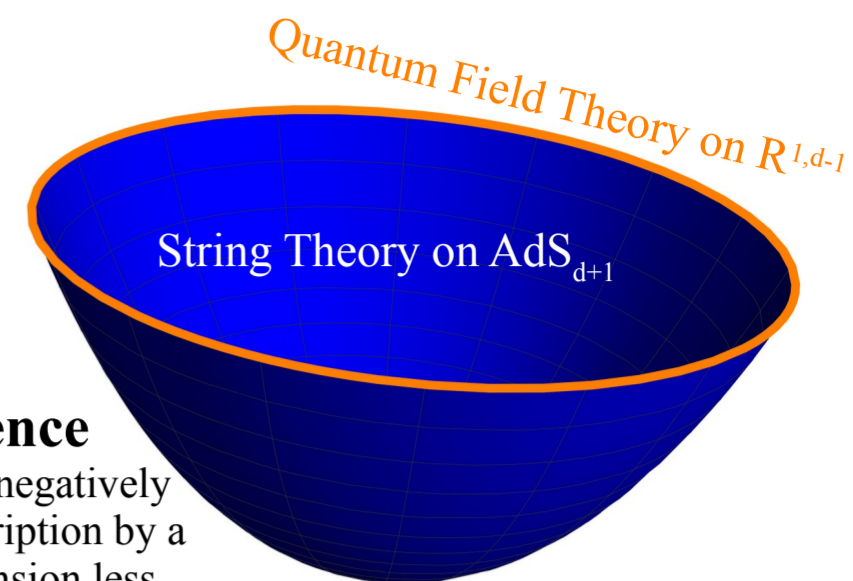


<http://www.spektrum.de/news/hochtemperatur-supraleiter-sind-doch-nicht-exotisch/1525845>



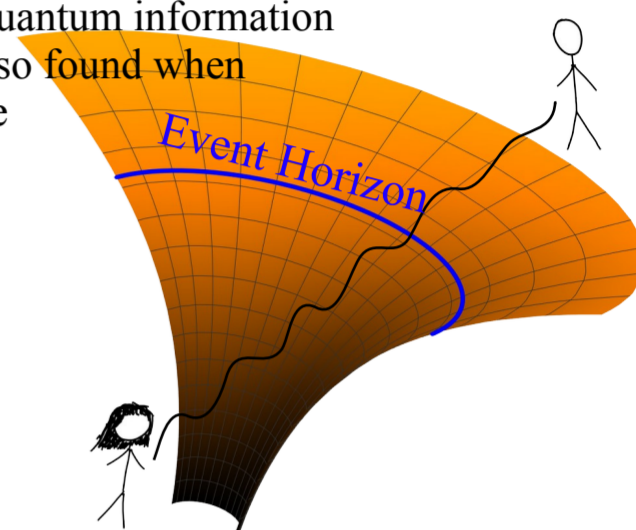
AdS/CFT Correspondence

A theory of (quantum) gravity in negatively curved spacetime has a dual description by a QFT without gravity in one dimension less



Quantum Information and Black Holes

Aspects of quantum information theory are also found when analysing the physics of black holes



Hydrodynamics and Black Holes

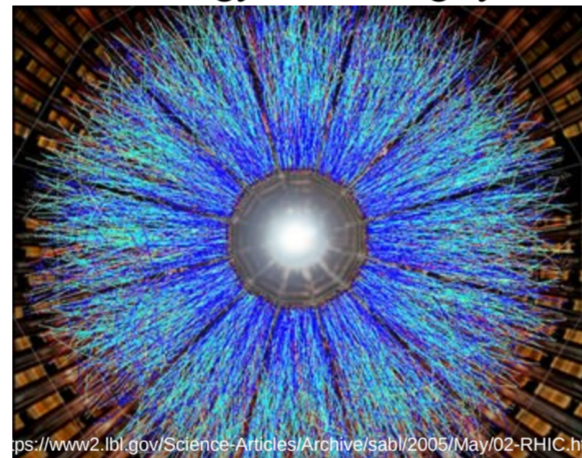
The dynamics of fluids can be mapped to black hole solutions of Einsteins equations



<https://www.pinterest.jp/pin/300896818835892119/>

Strongly Interacting Quantum Systems

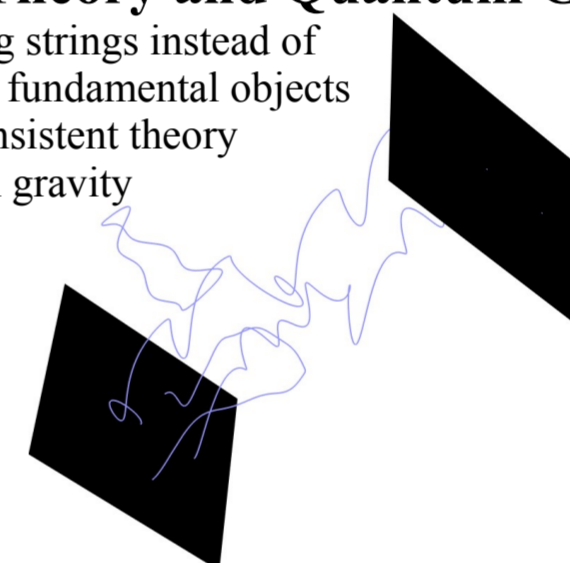
Perturbation theory is not applicable in strongly interacting systems. They can be studied using the AdS/CFT correspondence



<https://www2.lbl.gov/Science-Articles/Archive/sabl/2005/May/02-RHIC.html>

String Theory and Quantum Gravity

Considering strings instead of particles as fundamental objects yields a consistent theory of quantum gravity



We work on:

- Exploration and extension of the duality between QFT and gravitation (AdS/CFT Correspondence)
- Application of the duality in strongly coupled systems from particle physics and solid state physics
- Exploration of connections between quantum information, statistical physics and black holes

We offer:

- Involvement in research of our chair
- Close support

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Our webpage



Publications

