Strongly Correlated Electrons in Solid States
Strongly correlated phases of matter, such as superconductors, are described via the AdS/CFT correspondence.

Hydrodynamics and Black Holes
The dynamics of fluids can be mapped to black hole solutions of Einstein's equations.

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

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.

Statistical Physics
Large complex systems are made tractable using statistics and numerical methods.

Quantum Information and Black Holes
Aspects of quantum information theory are also found when analysing the physics of black holes.

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