Heavy-ion collisions at the Large Hadron Collider in CERN
High-energy physics

Quantum field theory

Gravity - General relativity

String theory
High-energy physics

Quantum field theory

Gravity - General relativity

String theory

Dirichlet (D)-branes
AdS/CFT correspondence

Type IIB string theory on $\text{AdS}_5 \times S^5 \rightarrow N=4 \text{ U}(N) \text{ super Yang-Mills theory in} \ D=4$

(Maldacena ‘98)

closed strings $\approx$ gravity

large-N limit

open strings $\approx$ YM theory

duality
My work

Holographic duality

Foundation
Renormalisation group

Verificatio
Hydrodynamics
QFTs with duals

Application
Strongly-coupled quantum liquids
Quark-gluon plasma
Wilsonian holographic renormalisation

- Renormalisation group
- Radial coordinate vs. energy scale
Quantum field theory and holography

- Dissipative hydrodynamics from effective field theory

- Supersymmetric theories with gravity duals at finite temperature and density
Applications of holography

• The electron star and quantum liquids with Lifshitz scaling

• Quark-gluon plasma