A Theory of Everything at Strong Coupling

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Abstract:

Over the past years an exciting new research area has emerged in Physics. It brings together physicists studying string theory, heavy ion collisions, condensed matter systems, and many more. What unifies all of these subjects are two questions: how do systems behave at strong coupling and/or far from equilibrium? The connection between these different subjects is provided by a particular holographic correspondence in combination with effective field theories. In this talk I will first provide a brief intuitive introduction to the concepts of this research area. Then we will consider four examples:

- superfluids/superconductors and their effective field theories,
- parity-violating transport in two and three spatial dimensions,
- holographic models far from equilibrium,
- topological phases.