





The Galileo Galilei Institute for Theoretical Physics Arcetri, Florence

Reconstructing the Gravitational Hologram with Quantum Information Jun 06, 2022 - Jul 15, 2022

Maldacena's 1997 discovery of gauge/gravity duality promised to provide a complete understanding of quantum effects in gravity, by relating gravitating quantum systems to conventional quantum field theories on fixed backgrounds. Although much has been learned, this initial promise has not been completely fulfilled, due to lingering questions associated with the basic dictionary describing the way observables are mapped between one description and the other. While the dictionary is under good control for observables near the boundary, and also at the level of perturbation theory about a classical bulk spacetime for observables further in, non-perturbative questions critical for a full resolution of the black hole information problem remain to be fully answered.

In the last few years, however, a number of developments arising from the application of quantum information theory to AdS/CFT seem to be indicating that it may now be possible to address some of these questions. This GGI workshop brings together experts and young researchers, in order to capitalize on these developments.

Training Week (Jun 13, 2021 - Jun 17, 2021) Focus Week (Jul 11, 2021 - Jul 15, 2021)

Organizing Committee:

Alice Bernamonti (University of Florence and INFN) Raphael Bousso (University of California, Berkeley) Netta Engelhardt (Massachusetts Institute of Technology) Thomas Faulkner (University of Illinois at Urbana-Champaign) Daniel Harlow (Massachusetts Institute of Technology) Patrick Hayden (Stanford University) Don Marolf (University of California, Santa Barbara) Kyriakos Papadodimas (International Centre for Theoretical Physics)

Topics:

- Gravity, Holography
- Black holes
- Information paradox and firewall problem

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- Quantum error correction
- QNEC and related new results in QFT





