



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Light cones and entanglement in AdS/CFT (Zoom Seminar)

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Zoom link shall be shared separately

The Ryu-Takayanagi formula is a remarkable connection between entanglement and geometry: it relates spacelike surfaces in AdS spacetimes to entanglement in conformal field theory. In this talk I summarize recent work which has found a qualitatively distinct entanglement-geometry connection in AdS/CFT. In particular, I explore the connected wedge theorem, which relates light cones in AdS and boundary entanglement. I discuss a recent strengthening of this connection given in 2101.08855 along with an adaptation of this theorem to AdS spacetimes with end-of-the-world branes given in 2102.01810. Following recent models of black hole evaporation using AdS spacetimes with ETW branes, we apply the connected wedge theorem to study when islands form. We find that causal features of the auxiliary AdS space signal the formation of islands in the Ryu-Takayanagi formula. In particular, if the black hole interior is causally connected to the radiation system through the ambient spacetime, then an island forms.