Department of Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Gravity from Quantum Entanglement in the AdS/CFT Correspondence (Part II)

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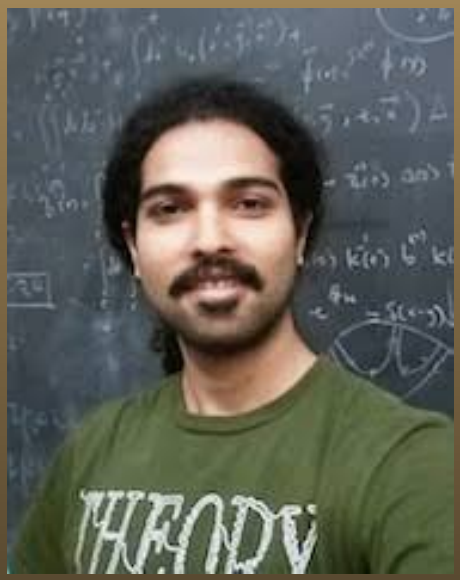
Date: February 25th, 2020 (Tuesday)

Time: 11:30 AM

Venue: A-304, TIFR



We will argue that any asymptotically AdS spacetime which computes the entanglement entropies of a CFT state with the Ryu-Takayanagi (RT) formula must necessarily satisfy the fully non-linear Einstein equation. At a technical level, our strategy involves studying the shape-dependence of entanglement entropy for arbitrary states and (simple connected) subregions in holographic conformal field theories. It is typically hard to work with general states/subregions without relying on symmetries, but we will combine field-theory and gravitational techniques to make progress. Our results show that gravitational dynamics emerges from the structure of entanglement in the dual CFT. This analysis also leads to a new quasi-Lorentzian proof (without using the replica trick) of the RT formula and suggests that RT is a natural consequence of matching between a certain bulk and boundary "algebraic" symmetry called modular flow.

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