



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

Gravity from Quantum Entanglement in the AdS/CFT correspondence

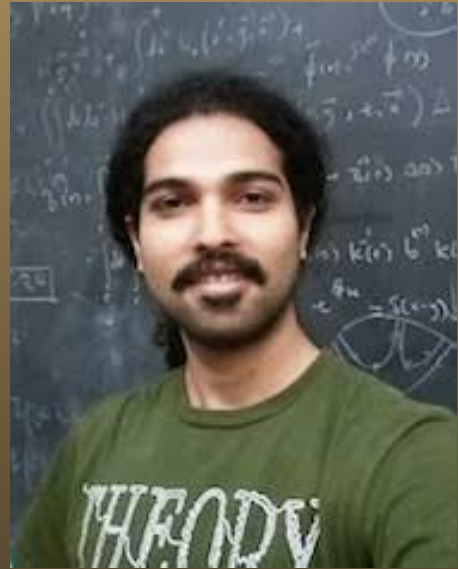
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Time: 11:30 AM

Venue: A-304, TIFR



The Anti de Sitter /Conformal Field Theory (AdS/CFT) correspondence has given us a window into the nature of quantum gravity. In particular, the Ryu-Takayanagi (RT) formula, relating the entanglement entropies in the CFT with areas of minimal-area surfaces in AdS, suggests that the bulk spacetime geometry emerges as a representation of the entanglement structure in the CFT. We will argue that any asymptotically AdS spacetime which computes the entanglement entropies of a CFT state with the RT formula must necessarily satisfy the fully non-linear Einstein equation, thus showing that gravitational dynamics also emerges from the structure of entanglement in the dual CFT. Using similar techniques, we will also give a quasi-Lorentzian proof of the RT formula and argue that RT is a natural consequence of matching between a certain bulk and boundary "algebraic" symmetry called modular flow.