



Department of  
Theoretical Physics

# THE QUANTUM SPACETIME SEMINAR SERIES

## Extremal surfaces, de Sitter entropy and entanglement in ghost systems

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**Date:** Feb 25, 2019

**Time:** 11.30 am

**Venue:** A-304, TIFR



We find connected codim-2 extremal surfaces stretching between the future and past boundaries in the static coordinatization of de Sitter space. These are analogous to rotated versions of certain surfaces in the AdS black hole. The existence of these surfaces via the dS/CFT framework suggests the speculation that dS4 is dual to two copies of ghost-like CFTs in a thermofield-double-type entangled state. In studies of entanglement in ghost systems and "ghost-spin" chains, we show that similar entangled states in two copies of ghost-spin ensembles always have positive norm and positive entanglement.