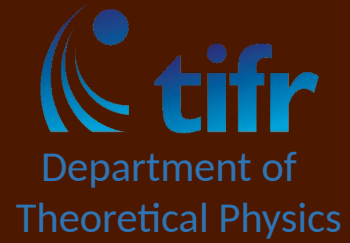


TATA-INFOSYS LECTURE SERIES:

Ronak Soni
(CMI, Chennai)



Lecture 1 (Tue, 1 Jul, 11:00am – 1:00pm,
A 304)

Lecture 2 (Wed, 2 Jul, 11:00am – 1:00pm,
A 304)

Lecture 3 (Fri, 4 Jul, 11:00am – 1:00pm,
A 304)

Concrete Bridges between Quantum Information and Gravity

The last ten years have seen massive advances in the understanding of quantum gravity (QG) via the techniques of quantum information (QI) theory. However, crucial steps in these connections can feel frustratingly abstract. I will go through some of my recent work partly or fully motivated by making these connections more concrete. I will focus on a seminal QI theorem of Harlow that relates the Ryu-Takayanagi formula and subregion duality in AdS/CFT (along with various refinements). First, I will show in a simple setting that demanding subregion duality in gravity gives us a restricted quantum extremal surface prescription, which is the part of RT formula the QI work has failed at. Based on arXiv:2403.19562. Secondly, I will take a fixed CFT and write down an operator that measures the bulk area. This will also give us insight into how the bulk is a coarse-grained description of the CFT. Thirdly, if time permits, I will talk about some derivations of tensor network descriptions of the holographic map.

[\(Click here for the zoom link\)](#)