



Department of  
Theoretical Physics

# Tata-Infosys Lecture Series

## Probing the black hole interior in AdS/CFT

**Kyriakos Papadodimas**  
(ICTP, Italy)

**Date / Time** : Apr 16,  
2019, 11.30 am

Apr 18, 2019, 10:00 am

Apr 18, 2019, 11:30 am

**Venue:** A-304, TIFR



It is believed that the black hole information paradox is closely related to the question of whether spacetime extends behind the black hole horizon. We review arguments connecting these questions and discuss attempts towards describing the black hole interior in the AdS/CFT correspondence. We present a conjecture about the geometry of a typical black hole microstate and how it can be probed by perturbing the CFT Hamiltonian with state-dependent operators, thus implementing a 1-sided analogue of the Gao-Jafferis-Wall traversable wormhole protocol. We formulate necessary conditions for the existence of a smooth interior for typical microstates, in terms of the chaotic behavior of out-of-time-order-correlators at scrambling time. We discuss how some of these questions can be studied in the SYK model.