



Department of
Theoretical Physics

THE QUANTUM SPACETIME SEMINAR SERIES

2+1 D gravity in asymptotically AdS spacetime in the maximal slicing gauge and quantum dynamics of a probe scalar

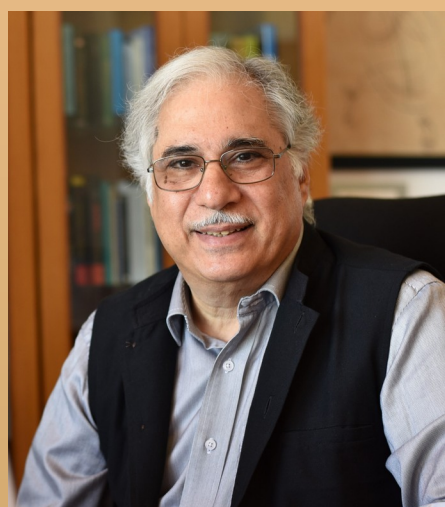
Spenta Wadia

(ICTS, Bengaluru)

Date: Oct 13, 2025

Time: 11.00 AM IST

Venue: A 304



In this 2 part talk we address some aspects of Einstein gravity + matter in asymptotically AdS spacetimes with two boundaries: 1) The solution of 2+1 dim Einstein gravity with a cylindrical (wormhole) topology within the Hamiltonian formulation of General Relativity in the maximal slicing gauge and 2) The gauge invariant dynamics of a probe scalar field in the background of the solution in (1) that corresponds after a coordinate transformation to the extended static BTZ black hole solution. We present a well defined time dependent Hermitian Hamiltonian of the probe scalar in the product space of the two CFTs, which describes the time development of operators / states along the maximal slices as they traverse the horizon. Consequently there is an unitary description of the crossing of the horizon by wave-packets built out of a finite number of scalar field excitations on top of the Hartle-Hawking state. We will also discuss the 2-point correlation function in various regions of the two-sided BTZ blackhole.

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