ICTS String Seminar

Title : Reduced phase space quantization of 3D gravity: Maximal slicing and beyond

Speaker : Anurag Kaushal (ICTS-TIFR, Bengaluru)

Date : Monday, 16 March 2026

Time : 3:30 PM (IST)

Abstract : We identify the diffeomorphism-invariant gravitational degrees of freedom in 2+1 dimensional asymptotically AdS spacetimes with cylindrical spatial slices. Working in the Hamiltonian formalism of Einstein's theory, we systematically obtain an explicit description of the diff-invariant degrees of freedom and their dynamics. To achieve this, we impose the maximal slicing and spatial harmonic gauge conditions and demonstrate that the gauge is fixed completely. The reduced degrees of freedom arise from the non-trivial topology of the spatial wormhole, and describe a two dimensional phase space. We quantize the reduced phase space and solve the corresponding Schroedinger equation to obtain the wave functions with a continuous positive energy spectrum. Each energy eigenvalue E corresponds to the two-sided BTZ black hole of mass $M=E/2$. Finally, we briefly discuss a similar analysis for de Sitter space.

Venue : Chern Lecture Hall
Zoom Link: https://icts-res-in.zoom.us/j/88092766911?pwd=R3ZrVk9yeW96ZmQ4ZG9KRzVhenRKZz09
Meeting ID: 880 9276 6911
Passcode: 232322