



ICTS

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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

## ICTS Synopsis Seminar

**Title** : Black Holes in AdS: Singularities and Thermodynamics

**Speaker** : Kaustubh Singhi (ICTS-TIFR, Bengaluru)

**Date** : Tuesday, 28 July 2026

**Time** : 3:00 PM – 5:00 PM (IST)

**Abstract** : Black holes pose profound challenges to our understanding of gravity and quantum physics. In this talk, I will discuss two such challenges in the context of asymptotically anti-de Sitter (AdS) spacetimes. First, although classical information cannot escape a black hole interior, I will show that, within the framework of quantum gravity, observables accessible outside the horizon encode geometric information about the interior, including the black hole singularity. Second, I will revisit the Euclidean path integral approach to black hole thermodynamics. While complex black hole saddle points can seemingly alter the thermal phase structure, such modifications are incompatible with expectations from the dual holographic conformal field theory (CFT). I will explain how this apparent conflict is resolved, leading to a consistent picture of black hole thermodynamics.

**Venue** : Feynman Lecture Hall

Zoom Link: <https://icts-res-in.zoom.us/j/92586744981?pwd=OlR5wrDeGbsv5ExqybafzOgqBbQ4HG.1>

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