Contribution ID: **12** Type: **not specified**

Contributed Talk - Holographic Entanglement Entropy at Spatial Infinity in Flat Space - Abir Ghosh, IISc

Sunday 24 August 2025 15:00 (30 minutes)

In AdS/CFT, entanglement entropy for boundary subregions is computed via Ryu-Takayanagi (RT) surfaces anchored to the conformal boundary. Extending this framework to asymptotically flat spacetimes presents conceptual challenges due to the lack of a causal boundary structure. In this talk, I introduce the notion of a "spi-subregion"—a bi-partitioning of spatial infinity (spi)—and demonstrate how it provides a natural holographic data set for defining entanglement entropy in flat space. I show that the RT surfaces associated with symmetric spi-subregions correspond to the waists of Asymptotic Causal Diamonds, reducing to Rindler horizons in empty flat space and exhibiting phase transitions in the presence of black holes. These transitions mirror those found in AdS black holes, suggesting a deep structural parallel. A key insight is that the radial cut-off in flat space acts as an IR regulator, and the resulting entanglement entropy is UV-finite, consistent with the long string paradigm. This work highlights the viability of holographic entanglement entropy in flat space and its implications for non-local dual descriptions.

Session Chair : Nirmalya Kajuri