ICTS String Seminar

Title : A physical protocol for observers near the boundary to obtain bulk information in quantum gravity

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Time : 03:00 pm (IST)

Abstract : We consider a set of observers who live near the boundary of global AdS, and are allowed to act only with simple low-energy unitaries and make measurements in a small interval of time. The observers are not allowed to leave the near-boundary region. We describe a physical protocol that nevertheless allows these observers to obtain detailed information about the bulk state. This protocol utilizes the leading gravitational back-reaction of a bulk excitation on the metric, and also relies on the entanglement-structure of the vacuum. For low-energy states, we show how the near-boundary observers can use this protocol to completely identify the bulk state. We explain why the protocol fails completely in theories without gravity, including non-gravitational gauge theories. This provides perturbative evidence for the claim that one of the signatures of holography -- the fact that information about the bulk is also available near the boundary -- is already visible in semiclassical gravity.

This is work done in collaboration with Olga Papadoulaki and Suvrat Raju and the reference is: https://arxiv.org/abs/2008.01740

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