Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

Jeudi 10 Fevrier 2022, 14:00

Sandipan Kundu

New Bounds on Chaos and Quantum Gravity

Chaos, in quantum systems, can be diagnosed by certain out-of-time-order correlators (OTOCs) that obey the chaos bound of Maldacena, Shenker, and Stanford (MSS). In this talk, I will show that this class of OTOCs must satisfy an infinite set of constraints, generalizing the MSS bound. Theories of quantum gravity and their holographic duals are known to be maximally chaotic, saturating the MSS bound at early times. However, these new bounds imply that the MSS bound cannot be exactly saturated over any duration of time, however short. On the other hand, I will discuss a unique analytic extension of the maximal chaos that saturates all the new chaos bounds. This extremal OTOC has the feature that information of the initial perturbation is recovered at very late times. I will argue that all analytic completions of maximal chaos must be small deformations of extremal chaos.

Institut Henri Poincaré, salle 314, 3ème étage

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