Type: Talk

A geometric look at unitarity in the wavefunction

Friday 17 November 2023 14:30 (30 minutes)

In the spirit of better understanding the relation between physical observables and first principles, we have analysed the consequences of perturbative unitarity on the wavefunction of the universe. We have done that from the point of view of cosmological polytopes, a combinatorial description of the wavefunction in terms of positive geometries. We have found that unitarity is encoded into a non-convex part of the cosmological polytope, which we name optical polytope. This provides an invariant formulation of the wavefunction cutting rules, which in this picture emerge as an equivalence between different polytope triangulations. In addition, this point of view allows to see the S-matrix optical theorem arise from the non-convexity of the optical polytope.

Author: DUASO PUEYO, Carlos (DAMTP, University of Cambridge)

Presenter: DUASO PUEYO, Carlos (DAMTP, University of Cambridge)