High Energy Theory Group Seminars

SPEAKER: Lorenzo Di Pietro

TITLE: **Analyticity and Unitarity for Cosmological Correlators**

DATE: 6 Oct 2021, 15:00

PLACE: VIA ZOOM

ABSTRACT

I will consider quantum field theory on a rigid de Sitter space. We show that the perturbative expansion of late-time correlation functions to all orders can be equivalently generated by a non-unitary Lagrangian on a Euclidean AdS geometry. We use this to infer the analytic structure of the spectral density that captures the conformal partial wave expansion of a late-time four-point function, to derive an OPE expansion, and to constrain the operator spectrum. Generically, dimensions and OPE coefficients do not obey the usual CFT notion of unitarity. Instead, unitarity of the de Sitter theory manifests itself as the positivity of the spectral density. We illustrate and check these properties by explicit calculations in a scalar theory by computing first tree-level, and then full one-loop-resummed exchange diagrams.

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