

Tarek Anous - The discreet charm of the discrete series in dS_2

Thursday 17 August 2023 09:30 (50 minutes)

Unitarity in de Sitter is mired with potential pitfalls. One of them is that massive particles are represented by (so-called principal series) states with complex conformal dimensions. Even more confusing is that states with positive conformal dimensions and a bounded spectrum, known as the discrete series, are, at the free-field level, represented as scalar tachyons with a finely tuned mass, suggesting that these states mediate some sort of instability. Perhaps this suggests that no consistent field theory can be built with these particle representations. In dS_2 , however, this can not be the case, as discrete series states arise in the multiparticle spectrum of principal series matter. In this talk I will review some established facts about the discrete series in de Sitter and its quantization. I will then consider models with a particular type of gauge symmetry, where the discrete series makes an appearance in the pre-Hilbert space, but vanishes once the gauge constraints are imposed. Finally I will discuss how this construction can be extended to the case where gravity is dynamical.