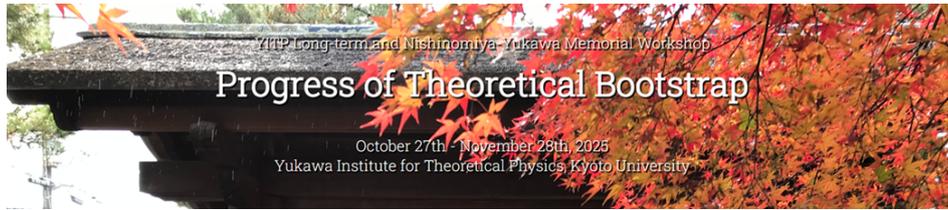


Progress of Theoretical Bootstrap



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Xi Tong "Unitary renormalisation and the quantum breaking of cosmological reality"

Monday, November 17, 2025 3:30 PM (1 hour)

Abstract: Cosmological correlators and the associated wavefunction coefficients serve as a smoking gun towards the physics of inflation at high energy scales. In minimal setups of single-field inflation, wavefunction coefficients are purely real at tree-level due to unitarity, locality and scale invariance, leading to the so-called no-go theorems on parity violation. Such parity-violating correlators are therefore null tests of fundamental principles. Yet interestingly, there exists a twist of plot when quantum loops are involved. We show that such cosmological reality must be spontaneously broken by the renormalisation of UV divergences in de Sitter loops. More specifically, unitarity and analyticity dictate a universal imaginary part from the logarithmic running of the real part of the wavefunction coefficients. We then discuss the implications related to this universality.