

Talk

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A microscopic realization of dS_3

I will discuss a recent proposal of a precise duality between pure $(2+1)$ -dimensional de Sitter quantum gravity and a double-scaled matrix integral. There are two main aspects of this correspondence. First, by discussing the canonical quantization of the gravitational phase space, I will arrive at a novel proposal for the quantum state of the universe at future infinity, which differs from the usual no-boundary proposal. I will then discuss the computation of cosmological correlators of massive particles in the universe specified by this wavefunction. Remarkably, these integrated cosmological correlators are precisely computed by the string amplitudes of the recently-introduced complex Liouville string (CLS), thereby establishing a direct connection between the cosmological correlators and resolvents of the matrix integral dual of CLS. The second aspect of the duality involves the Gibbons-Hawking entropy of the cosmological horizon of the de Sitter static patch. I will show that the de Sitter entropy can be reproduced exactly by counting degrees of freedom in the matrix model dual.