

## On Information Loss in Two-Dimensional CFT

*Thursday 23 June 2016 11:30 (1 hour)*

We discuss information loss from black hole physics in AdS<sub>3</sub>, focusing on two sharp signatures infecting CFT<sub>2</sub> correlators at large central charge  $c$ : ‘forbidden singularities’ arising from Euclidean-time periodicity due to the effective Hawking temperature, and late-time exponential decay in the Lorentzian region. We study an infinite class of examples where forbidden singularities can be resolved by non-perturbative effects at finite  $c$ , and we show that the resolution has certain universal features that also apply in the general case. Analytically continuing to the Lorentzian regime, we find that the non-perturbative effects that resolve forbidden singularities qualitatively change the behavior of correlators at times  $t \sim S_{\text{BH}}$ , the black hole entropy. This may resolve the exponential decay of correlators at late times in black hole backgrounds. By Borel resumming the  $1/c$  expansion of exact examples, we explicitly identify ‘information-restoring’ effects from heavy states that should correspond to classical solutions in AdS<sub>3</sub>. Our results suggest a line of inquiry towards a more precise formulation of the gravitational path integral in AdS<sub>3</sub>.

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