Institut Henri Poincaré

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String Theory in Greater Paris

Rencontres Théoriciennes

"Supergravité, théorie des cordes et théorie M"

Jeudi 26 Novembre 2020, 11:00

Francesco Benini

SISSA

Superconformal index and gravitational path-integral

AdS/CFT provides a consistent non-perturbative definition of quantum gravity in asymptotically AdS spacetimes. Black holes should correspond to ensembles of states in the boundary field theory. By performing a careful analysis of the superconformal index of 4d N=4 SU(N) Super-Yang-Mills theory, with the help of a Bethe Ansatz type formula, we are able to exactly reproduce the Bekenstein-Hawking entropy of BPS black holes in AdS5 x S5. The large N limit exhibits many competing contributions, that we are able to identify with complex saddles of the (putative) gravitational path-integral. Along the way we propose a necessary condition for complex saddles to contribute, based on the size of their non-perturbative corrections. Such a prescription exactly matches the field theory analysis.

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