

Institut Henri Poincaré  
11 rue Pierre et Marie Curie, 75231 Paris cedex 05  
**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  $AdS_5 \times S^5$ . 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.*

**Institut Henri Poincaré, salle 314, 3<sup>ème</sup> étage**

Retrouvez les activités de la communauté parisienne de théorie des cordes sur  
<http://string.lpthe.jussieu.fr>  
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<http://string.lpthe.jussieu.fr/semparis>

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