

The BPS limit of AdS black hole thermodynamics and its microscopic counterpart

Tuesday, 22 October 2019 09:00 (35 minutes)

The talk will present progress towards a microscopic understanding of the entropy of rotating BPS black holes in AdS. I will describe a new BPS limit of black hole thermodynamics which first focuses on a supersymmetric family of complexified solutions and then reaches extremality. In this limit the chemical potentials obey a constraint that is interpreted as a regularity condition in the Euclidean bulk geometry, and the on-shell gravitational action, which is the grand-canonical counterpart of the Bekenstein-Hawking entropy, takes a very simple form. I will then focus on AdS₅ black holes, where the gravitational analysis instructs us that the holographic dual N=1 superconformal field theory is defined on a twisted $S^1 \times S^3$ with complexified chemical potentials obeying the constraint, and localization allows to compute the partition function exactly. This computation defines a slightly modified superconformal index as well as a generalization of the supersymmetric Casimir energy. I will discuss how the black hole entropy is encoded in these quantities.

Primary author: CASSANI, Davide (PD)

Presenter: CASSANI, Davide (PD)

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