Counting in hyperbolic groups by Patterson-Sullivan measures

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The standard growth function $f(n)$ of a finitely generated group Γ counts the number of group elements that can be spelled by n generators. A geometrical or dynamical approach to its study is possible if equivalently one decides to count the growth of orbits of the natural action of Γ on its Cayley graph. However, it is even more interesting to do so if we choose a proper action of Γ on a proper geodesic metric space.

One reason is that, for instance, hyperbolic groups are a very vast class of finitely presented groups which by definition admit a proper and co-compact action on a proper Gromov-hyperbolic space. Coarsely, they behave "like" they were fundamental groups of compact manifolds with negative curvature. This concept was introduced by Gromov on the $80s$.

The aim of this talk is to explain how to give an estimation of the orbital growth of a group acting properly and co-compactly on a proper Gromov hyperbolic space X constructing a family of measures supported on its limit set; a set living at the boundary at infinity of X. This follows part of the exposition of [1].

References

[1] Coornaert, M. 'Mesures de Patterson-Sullivan sur le bord d'un espace hyperbolique au sens de Gromov,' *Pacific J. Math.* 159 (1993), no. 2, 241–270.