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## **Ruelle's operator and conformal measures with applications in fractal geometry and number theory**

Probabilistic invariant measures provide a central tool to describe asymptotic behavior of dynamical systems and their ergodic and stochastic properties. Starting with natural examples, I will present a method of constructing such measures. It consists in finding fixed points of Ruelle's operator and is applicable to dynamical systems that include smooth expanding maps, rational functions on the Riemann sphere, and holomorphic endomorphisms of complex projective spaces. I will tell how spectral properties of Ruelle's operator entail stochastic properties of a given dynamical system, especially the exponential decay of correlations, the central Limit Theorem, and the Law of Iterated Logarithm. I will also show how these spectral properties lead to the asymptotic of the number of circles in Apollonian packings. Asymptotic of lengths of closed geodesics on some hyperbolic spaces also will be discussed. Next, I will focus on fractal properties of Julia sets of rational functions and transcendental meromorphic functions. Finally, I will talk about geometric properties of continued fractions.