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Title : Segal Axioms and the conformal boostrap for all surfaces in Liouville CFT

Abstract: Liouville CFT is a conformal field theory developped in the early 80s in physics, it describes random surfaces and more precisely random Riemannian metrics on surfaces. We will explain, using the Gaussian multiplicative chaos, how to associate to each surface $ \Sigma$ with boundary an amplitude, which is an L^2 function on the space of fields on the boundary of Σ (i.e. the Sobolev space $H^{-s}(\mathbb{S}^1)^b$ equipped with a Gaussian measure, if the boundary of Σ has b connected components), and then how these amplitudes compose under gluing of surfaces along their boundary (the so-called Segal axioms).
This allows us to give formulas for all partition and correlation functions of the Liouville CFT in terms of 3 point correlation functions on the Riemann sphere (DOZZ formula) and the conformal blocks, which are
holomorphic functions of the moduli of the space of Riemann surfaces with marked points.
This gives a link between the probabilistic approach and the representation theory approach for CFTs, and a mathematical construction and resolution of an important non-rational conformal field theory.

This is joint work with A. Kupiainen, R. Rhodes and V. Vargas.