Stochastic quantization of exponential-type quantum field theories

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Stochastic quantization is a method, proposed by Parisi and Wu, of constructive Euclidean quantum field theory for building the Schwinger functions of a quantum model from the invariant solutions of suitable (parabolic, hyperbolic or elliptic) stochastic partial differential equations (SPDEs). In the talk we provide an introduction to the topic and to the recent developments in the field, focusing on the analytic and probabilistic aspects of the problem. We propose a more detailed analysis of the SPDEs related to the two-dimensional exponential-type models such as the Høegh-Krohn, or Liouville quantum gravity, quantum field theory and the massive $\sinh(\varphi)_2$ interaction. The talk is mainly based on the joint work [1] with Sergio Albeverio and Massimiliano Gubinelli, and a paper in preparation with Nikolay Barashkov.

[1] Albeverio, Sergio, Francesco C. De Vecchi, and Massimiliano Gubinelli. "The elliptic stochastic quantization of some two dimensional Euclidean QFTs." *arXiv preprint arXiv:1906.11187*, to appear in *Annales de l'Institut Henri Poincaré*.