Seminar/Talk

A priori bounds for the generalised Parabolic Anderson Model

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Host: Christian Wagner

We show a priori bounds for solutions to $(\partial_t - \Delta) u = \sigma (u) \xi$ in finite volume in the framework of Hairer's Regularity Structures [Invent Math 198:269--504, 2014]. We assume $\sigma \in C_b^2 (\mathbb{R})$ and that ξ is of negative H{\"o}lder regularity of order $- 1 - \kappa$ where $\kappa < \bar{\kappa}$ for an explicit $\bar{\kappa}< 1/3$, and that it can be lifted to a model in the sense of Regularity Structures. Our main results guarantee non-explosion of the solution in finite time and a growth which is at most polynomial in $t > 0$. Our estimates imply global well posedness for the 2-d generalised parabolic Anderson model on the torus, as well as for the parabolic quantisation of the Sine-Gordon Euclidean Quantum Field Theory (EQFT) on the torus in the regime $\beta^2 \in (4 \pi, (1 + \bar{\kappa}) 4 \pi)$. We also consider the parabolic quantisation of a massive Sine-Gordon EQFT and derive estimates that imply the existence of the measure for the same range of β. Finally, our estimates apply to It\^o SPDEs in the sense of Da Prato-Zabczyk [\textit{Stochastic Equations in Infinite Dimensions}, Enc. Math. App., Cambridge Univ. Press, 1992] and imply existence of a stochastic flow beyond the trace-class regime.

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Office Bldg West / Ground floor / Heinzel Seminar Room (I21.EG.101)

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