Local strong solution to the 2D stochastic Ericksen-Leslie Equations and the corresponding Quasipotential via the Ginzburg-Landau approximation.

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Abstract: This talk is about a constrained stochastic PDEs modelling the dynamics of 2-dimensional nematic liquid crystals under random perturbation, known as the stochastic Ericksen-Leslie equations (ELEs). I will discuss the existence of local strong solution to the stochastic Ericksen-Leslie equations. In particular, I will talk about the convergence the stochastic Ginzburg-Landau approximation of stochastic ELEs, and prove that the stochastic ELEs with the initial data in $\mathsf{H}^1 \times \mathsf{H}^2$ has at least a martingale, local solution which is strong in PDEs sense. In the last part, I will speak about deterministic Ericksen-Leslie equations with external controls. Such a model appears in the study of Large Deviations Principle for the stochastic ELEs and is called the skeleton equations.

This talk is based on joint works with G Deugoué and P Razafimandimby.