

Concentration inequalities for mean field particle models

(joint work with Emmanuel Rio)

Pierre Del Moral (INRIA Bordeaux Sud-Ouest / IMB, France)

Time **Wednesday, Febr 23, 2011 at 17:30**

Place **Campus Kirchberg, room C02**

This lecture is concerned with the fluctuations and the concentration properties of a general class of discrete generation and mean field particle interpretations of non linear measure valued processes. We combine an original stochastic perturbation analysis with a concentration analysis for triangular arrays of conditionally independent random sequences, which may be of independent interest. Under some additional stability properties of the limiting measure valued processes, uniform concentration properties with respect to the time parameter are also derived. The concentration inequalities presented here generalize the classical Hoeffding, Bernstein and Bennett inequalities for independent random sequences to interacting particle systems, yielding very new results for this class of models. We illustrate these results in the context of McKean Vlasov type diffusion models, McKean collision type models of gases, and of a class of Feynman-Kac distribution flows arising in stochastic engineering sciences and in molecular chemistry.