Stochastic integrators for multiscale and ergodic dynamical systems
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We discuss recent advances in the design of stochastic integrators for stiff and ergodic stochastic differential equations (SDEs). For SDEs with multiple scale, stability constraints usually prevent an explicit solver to access the coarse levels of a hierarchical sampling such as the multi-level Monte Carlo (MLMC) method. We then explain how this issue can be overcome by using appropriate stabilization procedures. In the second part of the talk we show that ideas coming from geometric integration, such as backward error analysis and modified equations, allow to construct new numerical integrators capable of capturing high order approximation of the invariant measure of ergodic SDEs.

This talk is based on joint works with various collaborators [1, 2, 3, 4, 5].

References:

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