

UNICAMP – IMECC  
Departamento de Matemática

## Seminário de Sistemas Dinâmicos e Estocásticos

**Expositor:** H. de la Cruz (IMPA)

**Título:** Stabilized integrators for stochastic differential equations driven by small additive noise

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**Local:** Sala 121 do IMECC

**Resumo.** Stochastic modelling has steadily gained importance in many different application areas, such as finance, neurosciences and biology. Often, fluctuations which affect the system are considerably small and state-independent. For much of these random systems the right model to study the phenomena is through stochastic differential equations (SDEs) with small additive noise (i.e., SDEs with small diffusion term). As usual in this context, analytic solutions for these systems are rarely available, so we need to rely on computational methods to obtain the solutions. Of course, numerical methods for general SDEs may be applied. For these general methods it is well-known that an appropriated trade-off among order of convergence and computational effort is difficult to achieve. That is why, wherever possible, special structural properties of the SDE under consideration should be exploited to simplify the schemes as much as possible. In this spirit, for the case of small noise SDEs, has been possible to obtain methods especially useful. However, research have been mainly aimed towards the development of integrators in view of the convergence analysis, and the further important issue of designing methods by their ability to preserve qualitative features of the continuous systems

has not been taking into consideration. In this talk we aim to face this limitation by proposing a class of new stabilized explicit integrators for the effective integration of small additive noise SDEs.

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