COURS THEMATIQUES

Au cours de l'automne 2018, une série de leçons sera organisée sur le thème

Stochastic quantisation of QFTs & applications to quantum gravity and early cosmology

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Stochastic Quantisation is a universal method with a wide field of applications. These series of lectures aim at motivating its use for quantum gravity and early cosmology, and giving a thorough portrait of its present status. Their content is organised as follows:

- Challenges and proposals in early cosmology and quantum gravity.
- Langevin equation for the Brownian motion.
- Langevin equation for QFT Euclidean correlators (Parisi – Wu approach).
- Emergence of Minkowski time in stochastic quantisation.
- Link with Fokker–Planck formulation, properties of convergence of correlation functions at infinite stochastic time.
- More recent formulation using stochastic time, supersymmetry and path integral representation.
- Connection with topological quantum field theory.
- Treatment of gauge theories within the stochastic quantisation approach – examples with various local symmetries.
- Compatibility between space–time supersymmetry and stochastic supersymmetry.
- Properties of the correlation functions at finite values of the stochastic time, depending on the rank of the Langevin equation.

CPHT – ECOLE POLYTECHNIQUE

Second and third lectures Friday October 12
Basics on stochastic quantisation
11:00 & 14:00 – salle Louis Michel – CPHT

Plan:

- Langevin equation for quantum field theory Euclidean correlators (Parisi–Wu approach) & link with Fokker–Planck formulation.
- Convergence properties of correlation functions at infinite stochastic time & emergence of Minkowski time.
- More recent formulation of stochastic quantisation with a path integral representation using the stochastic time as a bulk time.
- Examples.