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Feynman-Kac probabilistic representations of non linear partial differential equations -- Lescot, P., Valade, L.: Bernestein processes, isovectors and machanics -- Marinelli, C., Scarpa, L.: On the positivity of local mild solutions to stochastic evolution equations -- Privault, N.: Invariance of Poisson point processes by moment identities with statistical applications. .

Sommario/riassunto

This book grew out of the Random Transformations and Invariance in Stochastic Dynamics conference held in Verona from the 25th to the 28th of March 2019 in honour of Sergio Albeverio. It presents the new area of studies concerning invariance and symmetry properties of finite and infinite dimensional stochastic differential equations.This area constitutes a natural, much needed, extension of the theory of classical ordinary and partial differential equations, where the reduction theory based on symmetry and invariance of such classical equations has historically proved to be very important both for theoretical and numerical studies and has given rise to important applications. The purpose of the present book is to present the state of the art of the studies on stochastic systems from this point of view, present some of the underlying fundamental ideas and methods involved, and to outline the main lines for future developments. The main focus is on bridging the gap between deterministic and stochastic approaches, with the goal of contributing to the elaboration of a unified theory that will have a great impact both from the theoretical point of view and the point of view of applications. The reader is a mathematician or a theoretical physicist. The main discipline is stochastic analysis with profound ideas coming from Mathematical Physics and Lie’s Group Geometry. While the audience consists essentially of academicians, the reader can also be a practitioner with Ph.D., who is interested in efficient stochastic modelling.