Lévy Processes — Theory and Applications
Editors O.E. Barndorff-Nielsen (Aarhus), T. Mikosch (Groningen) and S.I. Resnick (Cornell), Birkhauser Boston, 450 pages, to appear in late fall 2000

Over the last few years a renaissance of Lévy process theory has occurred. Although the basics of the theory are well understood and documented in various recent textbooks such as J. Bertoin [Cambridge University Press, 1996] and K.-i. Sato [Cambridge University Press, 1999] the description of Lévy and infinitely divisible processes in terms of point processes has led to a better understanding of the structure of those processes. The emphasis of the volume is on non-Gaussian Lévy processes. With the exception of stable processes, as documented in the monograph of Samorodnitsky and Taqqu [Chapman and Hall, 1994], non-Gaussian Lévy processes have not received the attention they deserve in view of the various applications they find in areas as diverse as differential geometry, quantum theory, finance, insurance and telecommunications.

The present volume collects essays written by some of the leading experts; see the Table of Contents below. Every chapter aims to cover one particular topic. The chapters are written in such a way that they are accessible to the graduate student or researcher with basic knowledge in probability theory and the theory of stochastic processes. The chapters also contain state-of-the-art surveys on the general theory of Lévy processes and on some special topics. Various chapters are devoted to problems of simulation and statistical estimation of Lévy processes. The bulk of the chapters deals with the distributional and path properties of Lévy processes, representing unique expertises.

Table of Contents

1. S. Albeverio, B. Rüdiger, J.-L. Wu: Analytic and probabilistic aspects of Lévy processes and fields in quantum theory
2. D. Applebaum: Lévy processes in stochastic differential geometry
3. O.E. Barndorff-Nielsen and N. Shephard: Modelling by Lévy processess for financial econometrics
4. J. Bertoin: Some properties of Burgers turbulence with white or stable noise initial data
5. P. Carmona, F. Petit, M. Yor: Exponential functionals of Lévy processes
6. R. Doney: Fluctuation theory for Lévy processes
7. E. Eberlein: Application of generalized hyperbolic Lévy motions to finance
8. A.S. Holevo: Lévy Processes and continuous quantum measurements
9. N. Jacob and R.L. Schilling: Lévy-type processes and pseudo differential operators
10. Jin Ma, P. Protter and Jianfeng Zhang: Explicit form and path regularity of martingale representations
11. M. Maejima: Semi-stable distributions
12. M.B. Marcus, J. Rosen: Gaussian processes and the local times of symmetric Lévy processes
13. J.P. Nolan: Maximum likelihood estimation and diagnostics for stable distributions
14. J. Rosiński: Series representations of Lévy processes from the perspective of point processes
15. K.-i. Sato: Basic results on Lévy processes
16. T. Watanabe: Temporal change in distributional properties of Lévy processes
17. W.A. Woyczyński: Lévy Processes in the physical sciences
18. M. Yor: Interpretations in terms of Brownian and Bessel meanders of the distribution of a subordinated perpetuity