

The volume concludes with a section containing nine unsolved problems.

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**17[60-02, 60G07, 60H10, 65C05, 65C20].**—NICOLAS BOULEAU & DOMINIQUE LÉPINGLE, *Numerical Methods for Stochastic Processes*, Wiley Series in Probability and Mathematical Statistics, Wiley, New York, 1994, xx + 359 pp., 24 cm. Price \$64.95.

This book offers a rigorous exposition of numerical treatments of stochastic models. A considerable mathematical sophistication is expected of the reader, but a brief review of the prerequisites is provided in the first chapter. The authors distinguish two types of simulation methods, the Monte Carlo method based on the strong law of large numbers, and the shift method based on the pointwise ergodic theorem. The shift method is particularly appropriate in infinite-dimensional settings.

Chapter 2 describes the mathematical framework for the Monte Carlo method. There is also some material on quasi-Monte Carlo methods, but here more extensive and up-to-date treatments are available in other sources, e.g., in the CBMS-NSF monograph of the reviewer [1]. Chapter 3 discusses the simulation of random processes and random fields in an infinite-dimensional setting. Markov processes, point processes, and processes with stationary independent increments are highlighted. Chapter 4 deals with the deterministic resolution of some Markovian problems through methods such as balayage algorithms and the reduced function algorithm. The carré du champ operator is applied to hedging strategies in financial markets. The last chapter is devoted to the numerical resolution of stochastic differential equations and the computation of expectations of random variables defined on Wiener spaces.

The book is on the whole very reliable and accurate. There are only some minor quibbles, for instance, the title of the paper of Warnock (1972) is given incorrectly. Readers seeking an introduction to the area will find the style of the book somewhat terse.

H. N.

1. H. Niederreiter, *Random number generation and quasi-Monte Carlo methods*, SIAM, Philadelphia, PA, 1992.

**18[68Q40, 65Y25, 11-04, 12-04, 13-04, 14-04, 30-04, 33-04].**—JOHN GRAY, *Mastering Mathematica: Programming Methods and Applications*, AP Professional, Boston, 1994, xx + 644 pp., 23½ cm. Price: Softcover \$44.95.

If you are a mathematician familiar with, or interested in, the *Mathematica* programming system and if you share even some of the author's eclectic set of interests, you may find this book useful.