Preface

Ten years ago I would not have dared to write a book like this: a non-rigorous treatment of a mathematical theory. I admit that I would have been ashamed, and I am afraid that most of my colleagues in mathematics still think like this. However, my experience with students and practitioners convinced me that there is a strong demand for popular mathematics.

I started writing this book as lecture notes in 1992 when I prepared a course on stochastic calculus for the students of the Commerce Faculty at Victoria University Wellington (New Zealand). Since I had failed in giving tutorials on portfolio theory and investment analysis, I was expected to teach something I knew better. At that time, staff members of economics and mathematics departments already discussed the use of the Black and Scholes option pricing formula; courses on stochastic finance were offered at leading institutions such as ETH Zürich, Columbia and Stanford; and there was a general agreement that not only students and staff members of economics and mathematics departments, but also practitioners in financial institutions should know more about this new topic.

Soon I realized that there was not very much literature which could be used for teaching stochastic calculus at a rather elementary level. I am fully aware of the fact that a combination of "elementary" and "stochastic calculus" is a contradiction in itself. Stochastic calculus requires advanced mathematical techniques; this theory cannot be fully understood if one does not know about the basics of measure theory, functional analysis and the theory of stochastic processes. However, I strongly believe that an interested person who knows about elementary probability theory and who can handle the rules of integration and differentiation is able to understand the main ideas of stochastic calculus. This is supported by my experience which I gained in courses for economics, statistics and mathematics students at VUW Wellington and the Department of Mathematics in Groningen. I got the same impression as a lecturer of crash courses on stochastic calculus at the Summer School of the

Swiss Association of Actuaries in Lausanne 1994, the Workshop on Financial Mathematics in Groningen 1997 and at the University of Leuven in May 1998.

Various colleagues, friends and students had read my lecture notes and suggested that I extend them to a small book. Among those are Claudia Klüppelberg and Paul Embrechts, my coauthors from a book about extremal events, and David Vere-Jones, my former colleague at the Institute of Statistics and Operations Research in Wellington. Claudia also proposed to get in contact with Ole Barndorff-Nielsen who is the editor of the probability series of World Scientific. I am indebted to him for encouraging me throughout the long process of writing this book.

Many colleagues and students helped in proofreading parts of the book at various stages. In particular, I would like to thank Leigh Roberts from Wellington, Bojan Basrak and Diemer Salome from Groningen. Their criticism was very helpful. I am most grateful to Carole Proctor from Sussex University. She was a constant source of inspiration, both on stylistic and mathematical issues. I also take pleasure in thanking the Department of Mathematics at the University of Groningen, my colleagues and students for their much appreciated support.

Thomas Mikosch Groningen, June 1, 1998