Preface

The subject of stochastic differential equations in infinite dimensional spaces and stochastic partial differential equations has grown in importance since the publication of K. Itô's CBMS monograph, J. Walsh's article in the *École d'Été* de probabilités de Saint Flour, and two recent books: by B. L. Rozovskii in 1990 and by G. Da Prato and J. Zabczyk in 1992. (Precise references are given at the end of this volume).

SDE's in infinite dimensional spaces occur as stochastic models in the investigation of problems that arise in a variety of disciplines such as neurophysiology, environmental pollution, chemical reaction diffusion, infinite particle systems and turbulence. Not all of these applications are discussed in the monograph. In fact, some of the problems such as a stochastic treatment of turbulence are subjects of intensive current research. The specific choice of topics for these lectures was motivated by the interest of one of us (G. K.) in problems of neuronal behavior which led to the development of the theory presented here. As a consequence, a greater emphasis is placed on SDE's and SPDE's driven by Poisson random measures (the latter being the simplest representative of a point process) and on approximations to diffusion equations. Stochastic models of this type occur also in other applications and are worthy of further study.

For the convenience of the reader, especially of the aspiring graduate student, we have tried to make the monograph as self-contained as possible by including three chapters containing topological and probabilistic preliminaries essential for the understanding of the later material. The first named author thanks Professors Balram Rajput and Jan Rosinski, and the University of Tennessee for the invitation to deliver the 1993 Barrett Lectures. Both of us thank the former and present editors of the IMS Monograph Series for their cooperation.

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