

## **Book's reviews/reseñas bibliográficas**

### **INTRODUCTION TO OPTION PRICING THEORY**

G. Kallianpur and R.L. Karandikar, 2000  
ISBN 0-8176-4108-4 ISBN 3-7643-4108-4  
Birckhäuser, Boston.

The past ten to fifteen years have seen a significant development in what has come to be known as Mathematical Finance. It has attracted a wide diversity of economists and mathematicians interested in the mathematical characterization of finance mechanisms and phenomena. This book is devoted to the discussion of Option Price as a part of Stochastic Finance Theory. It falls in the category of "probabilistics" although it is fairly comprehensive in its treatment of the main outline of its subject. The first five chapters treat probabilistic problems. A well trained specialist in Stochastic Processes does not need to read them but other specialists may have the need of consulting, or studying them. They are the contain of 2/3 of the book.

Chapter 6 is devoted to option prices when we deal with discrete time or continuous. In all the material presented an informal description of technical terms is given as an introduction. They enhance the reader to connect finance terminology with the mathematical modeling developed. Afterwards they are mathematized.

In Chapter 8 necessary and sufficient conditions are established for non-arbitrage characterized by the structure of the continuous semimartingales or more general stochastic processes used for modeling stock prices.

Chapter 9 presents the notion of completeness and its role in the uniqueness of the price of American, European call and put options are studied. The stocks are continuous semimartingales and the bonds are continuous increasing processes. The main results in this chapter established that the completeness is linked with the uniqueness of the equivalent martingale measure. Two examples are worked out. Chapter 10 copes with the theory developed by Black and Scholes for which permits to model an option price formula. It is deduced and an example of the diffusion model for  $k$  stocks is used for illustrating the formula deduction procedure. Chapter 11 presents a discussion of the discrete approximation of previous formulae. The binomial model is discussed, and the approximation deduced, using it, for Feynman-Kac and Black-Scholes formulae are deduced. Chapters 12 and 14 are devoted of the modeling of American and Russian options using the results introduced in Chapters 6-11. Chapter 13 contains contributions of the authors to option price theory.

The book is well written and with an even handed presentation of rather new results. It is recommended to mathematicians who are concerned with the kinds of thinking economists have been bringing to models of the economy.

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# ANALYSIS AND GEOMETRY ON COMPLEX HOMOGENEOUS DOMAINS

Jacques Faraut, Soji Kanayuki, Adam Korany, Qikeng Lu and Guy Roos (2000)

ISBN 0-8176-4138-6 ISBN 3-7643-4138-6 SPIN 1078121

xvii + 540

Birkhauser, Boston. Serie Progress in Mathematics Vol 185.

The book is divided into five parts. Each of them covers the contents of one of the courses read at CIMPA's Autumn School "Analysis and Geometry on Complex Homogeneous Domains" held in Beijing, China, during the last 15 days of September 1997.

The first part is devoted to "Function Spaces on Complex Semi-groups" and is due to J. Faraut. This part deals with the study of the program of Gelfand-Ginidikin and the subsequent theory of generalized Hardy spaces. The subject of Part II is the study of Lie Algebras [S. Kaneyuki] and Part III with problems on Function Spaces on Bounded Domains [A. Koranyi]. It studies mainly properties of function spaces on bounded symmetric domains. The sense of the "symmetrie" is to ensure that the group of holomorphic automorphisms is transitive on it. The theorems of Borel and Harish-Chandra are the nucleus of the chapter. Part IV deals with the discussion of complex bounded symmetric domains the connections with the imbedding of Borel spaces into the compact dual spaces, in line with the results of O. Loos [Jordan Pairs, Springer Verlag, 1995 & Bounded Symmetric Domain and Jordan pairs. Math, Lectures, Univ. of California, 1977]. It is close related weith the contents of Part V [G. Roos]: Jordan Triple Systems.

This book is very good for graduate students. Though it is introductory a complete coverage of Complex Analysis and Geometry is given. Different examples illustrate the sense of the results. The authors are leading experts in this field.

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# OPTIMAL CONTROL OF PARTIAL DIFFERENTIAL EQUATIONS

K.H. Hoffmann, G. Leugering y F. Tröltzsch  
ISNM Vol. 133

El presente libro constituye una recopilación de artículos de problemas actualizados de la física-matemática presentados en la Conferencia Internacional sobre Control Óptimo de Ecuaciones Diferenciales Parciales celebrada en Chemnitz, Alemania en abril de 1998.

La publicación contiene 27 artículos en un total de 323 páginas que tratan sobre investigaciones físico-matemáticas relacionadas con la controlabilidad y la estabilización de soluciones, sobre control óptimo de diferentes tipos de procesos, así como sobre problemas cualitativos de las ecuaciones en derivadas parciales, tanto desde el punto de vista del desarrollo teórico de los temas, como del desarrollo de algoritmos de cálculo y su implementación numérica.

Considero que el libro puede servir como fuente importante de consulta para estudiantes e investigadores en los campos de la Matemática y la Física Teórica.

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