

# Analyse combinatoire

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logy of loop spaces. An outstanding and original mathematician, Chen's work falls naturally into three periods: his early work on group theory and links in the three sphere; his subsequent work on formal differential equations, which gradually developed into his most powerful and important work; and his work on iterated integrals and homotopy theory, which occupied him for the last twenty years of his life. The goal of Chen's iterated integrals program, which is a de Rham theory for path spaces, was to study the interaction of topology and analysis through path integration.

Hans WALSER. — **The golden section.** — Translated from the original German by Peter Hilton, with the assistance of Jean Pedersen. — Un vol. broché,  $15 \times 23$ , de xvi, 142 p. — ISBN 0-8835-534-8. — Prix: £17.95. — The Mathematical Association of America, Washington, distributed by Cambridge University Press, Cambridge, 2001.

Since antiquity, the golden section has played a significant role in many parts of geometry, architecture, music, art, and philosophy. But it also appears in the newer domains of technology and fractals. In this way, the golden section is no isolated phenomenon but rather, in many cases, the first and also the simplest non-trivial example in a sequence of generalizations leading to further developments. It is the purpose of this book, on the one hand, to describe examples of the golden section, and on the other, to show some paths to further extensions. The treatment is informal and the text is enriched by the presence of especially illuminating diagrams.

## **Analyse combinatoire**

Béla BOLLOBÁS. — **Random graphs.** — 2<sup>nd</sup> edition. — Cambridge studies in advanced mathematics, vol. 73. — Un vol. broché,  $15 \times 23$ , de xviii, 498 p. — ISBN 0-521-79722-5 (relié: 0-521-80920-7). — Prix: £29.95 (relié: £75.00). — Cambridge University Press, Cambridge, 2001.

The already extensive treatment given in the first edition has been heavily revised by the author. The addition of two new sections, numerous new results and over 150 references means that this represents an up to date and comprehensive account of random graph theory. One of the aims of the theory is to estimate the number of graphs of a given order that exhibit certain properties. This is achieved with the use of probabilistic ideas as opposed to an exact deterministic approach. This theory not only has numerous combinatorial applications, but also serves as a model for the probabilistic treatment of more complicated random structures.

J.W.P. HIRSCHFELD, (Editor). — **Surveys in combinatorics, 2001.** — London Mathematical Society lecture note series, vol. 288. — Un vol. broché,  $15,5 \times 23$ , de x, 301 p. — ISBN 0-521-00270-2. — Prix: £27.95. — Cambridge University Press, Cambridge, 2001.

The British Combinatorial Conference is held every two years and is now a key event for mathematicians world-wide, working in combinatorics. This volume is published on the occasion of the 18<sup>th</sup> meeting, which was held 1 to 6 July, 2001 at the University of Sussex. The papers contained here are surveys contributed by the invited speakers, and are thus of a quality befitting the event. There is also a tribute to Crispin Nash-Williams, past chairman of the British Combinatorial Committee.

Richard P. STANLEY. — **Enumerative combinatorics, vol. 2.** — Cambridge studies in advanced mathematics, vol. 62. — Un vol. broché,  $15 \times 23$ , de xii, 585 p. — ISBN 0-521-78987-7. — Prix: £47.50. — Cambridge University Press, Cambridge, 2001.

This is the second of a two-volume basic introduction to enumerative combinatorics at a level suitable for graduate students and research mathematicians. This volume covers the compo-

sition of generating functions, trees, algebraic generating functions, D-finite generating functions, noncommutative generating functions, and symmetric functions. The chapter on symmetric functions provides the only available treatment of this subject suitable for an introductory graduate course and focusing on combinatorics, especially the Robinson-Schensted-Knuth algorithm. Also covered are connections between symmetric functions and representation theory. An appendix (written by Sergey Fomin) covers some deeper aspects of symmetric function theory, including jeu de taquin and the Littlewood-Richardson rule.

W.D. WALLIS. — **Magic graphs.** — Un vol. broché,  $15,5 \times 23,5$ , de xiv, 146 p. — ISBN 0-8176-4252-8. — Prix: SFr. 78.00. — Birkhäuser, Boston, 2001.

This concise, self-contained book is unique in its focus on the theory of magic graphs/labelling and its applications to a number of new areas, e.g., networks, the construction of rulers, and pulse codes. It may serve as a graduate text for a special topics seminar in mathematics or computer science, or as a professional text for the researcher. Some key features: concise exposition from basic topics in graph theory to current research; theorems from graph theory and interesting counting arguments.

## ***Théorie des nombres***

Richard CRANDALL, Carl POMERANCE. — **Prime numbers: a computational perspective.** — Un vol. relié,  $17 \times 24,5$ , de xv, 545 p. — ISBN 0-387-94777-9. — Prix: DM 98.00. — Springer, New York, 2001.

Destined to become a definitive textbook conveying the most modern computational ideas about prime numbers and factoring, this book will stand as an excellent reference for this kind of computation, and thus be of interest to both educators and researchers. It is also a timely book, since primes and factoring have reached a certain vogue, partly because of cryptography. The final chapter focuses on “applications” of prime numbers, incorporating the mathematics of finance, via quasi-Monte Carlo theory. Historical comments are contained in every chapter. — *Contents:* Primes! — Number-theoretical tools. — Recognizing primes and composites. — Primality proving. — Exponential factoring algorithms. — Sub-exponential factoring algorithms. — Elliptic curve arithmetic. — The ubiquity of prime numbers. — Fast algorithms for large-integer arithmetic.

Maruti Ram MURTY. — **Problems in analytic number theory.** — Graduate texts in mathematics, vol. 206. — Un vol. relié,  $16 \times 24$ , de xvi, 452 p. — ISBN 0-387-95143-1. — Prix: DM 98.00. — Springer, New York, 2001.

This book gives a problem-solving approach to the difficult subject of analytic number theory. It is primarily aimed at graduate and senior undergraduate students. The goal is to give a rapid introduction of how analytic methods are used to study the distribution of prime numbers. The book also includes an introduction to  $p$ -adic analytic methods. It is ideal for a first course in analytic number theory. *From the preface:* This book is a collection of about five hundred problems in analytic number theory with the singular purpose of training the beginning graduate student in some of its significant techniques.

Harald NIEDERREITER, Chaoping XING. — **Rational points on curves over finite fields: theory and applications.** — London Mathematical Society lecture note series, vol. 285. — Un vol. broché,  $15 \times 23$ , de x, 245 p. — ISBN 0-521-66543-4. — Prix: £27.95. — Cambridge University Press, Cambridge, 2001.

Ever since the seminal work of Goppa on algebraic-geometry codes, rational points on algebraic curves over finite fields have been an important research topic for algebraic geometers