

# Théorie des nombres

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M. LOTHAIRE. — **Algebraic combinatorics on words.** — Encyclopedia of mathematics and its applications, vol. 90. — Un vol. relié, 16×23,5, de XIII, 504 p. — ISBN 0-521-81220-8. — Prix: £60.00. — Cambridge University Press, Cambridge, 2002.

Combinatorics on words has arisen independently within several branches of mathematics, for instance number theory, group theory and probability, and appears frequently in problems related to theoretical computer science. The first unified treatment of the area was given in Lothaire's book *Combinatorics on Words*. Since its publication, the area has developed and the author now aims to present several more topics as well giving deeper insights into subjects that were discussed in the previous volume. This book is both a comprehensive introduction to the subject and a valuable reference source for researchers. There are numerous examples, full proofs whenever possible and note sections discussing further developments in the area.

J.H. VAN LINT, R. M. WILSON. — **A course in combinatorics.** — Second edition. — Un vol. broché, 18×25, de XIV, 602 p. — ISBN 0-521-00601-5. — Prix: £24.95. — Cambridge University Press, Cambridge, 2001.

This is the second edition of a popular book on combinatorics, a subject dealing with ways of arranging and distributing objects, and which involves ideas from geometry, algebra and analysis. The breadth of the theory is matched by that of its applications, which include topics as diverse as codes, circuit design and algorithm complexity. It has thus become essential for workers in many scientific fields to have some familiarity with the subject. The authors have tried to be as comprehensive as possible, dealing in a unified manner with, for example, graph theory, extremal problems, designs, colorings and codes. The depth and breadth of the coverage make the book a unique guide to the whole of the subject.

## *Ordre, treillis*

B. A. DAVEY, H. A. PRIESTLEY. — **Introduction to lattices and order.** — Second edition. — Un vol. broché, 23×15, de XII, 298 p. — ISBN 0-521-78451-4. — Prix: £19.95. — Cambridge University Press, Cambridge, 2002.

This new edition presents a radical reorganization and updating of the content of the successful first (1990) edition. The primary aim of the original – to serve as a textbook devoted to ordered sets and lattices and to their contemporary applications – is unchanged. The explosive development of theoretical computer science in recent years has, in particular, influenced the book's evolution: a fresh treatment of fixpoint theorems testifies to this and Galois connections now feature prominently. Concept analysis, a methodology for data analysis, has been moved forward, so as to allow an early presentation of both a concrete foundation for the subsequent theory of complete lattices and an application of order theory which is of commercial value in social science.

## *Théorie des nombres*

Michal KRÍŽEK, Florian LUCA, Lawrence SOMER. — **17 lectures on Fermat numbers: from number theory to geometry.** — With foreword by Alena Šolcová. — CMS books in mathematics. Ouvrages de mathématiques de la SMC, vol. 9. — Un vol. relié, 24×16, de XXIV, 257 p. — ISBN 0-387-95332-9. — Prix: € 69.95. — Springer, New York, 2001.

The purpose of this book is to provide readers with an overview of the many properties of Fermat numbers and to demonstrate their numerous appearances and applications in areas such as number theory, probability theory, geometry, and signal processing. This book introduces a general mathematical audience to basic mathematical ideas and algebraic methods connected with the Fermat numbers and provides invaluable reading for amateur and professional alike.

Michael ROSEN. — **Number theory in function fields.** — Graduate texts in mathematics, vol. 210. — Un vol. relié,  $16 \times 24$ , de XII, 358 p. — ISBN 1-85233-437-1. — Prix: € 54.95. — Springer, New York, 2002.

Elementary number theory is concerned with arithmetic properties of the ring of integers. Early in the development of number theory, it was noticed that the ring of integers has many properties in common with the ring of polynomials over a finite field. The first part of this book illustrates this relationship by presenting analogues of the theorems of Fermat and Euler, Wilson's theorem, quadratic (and higher) reciprocity, the prime number theorem, and Dirichlet's theorem on primes in an arithmetic progression. After presenting the required foundational material on function fields, the later chapters explore the analogy between global function fields and algebraic number fields. A variety of topics are presented, including the ABC-conjecture, Artin's conjecture on primitive roots, the Brumer-Stark conjecture, Drinfeld modules, class number formulae, and average value theorems.

### *Corps et polynômes*

Ian STEWART, David TALL. — **Algebraic number theory and Fermat's last theorem.** — 3<sup>rd</sup> edition. — Un vol. relié,  $15 \times 23,5$ , de XIX, 313 p. — ISBN 1-56881-119-5. — Prix: US\$38.00. — A. K. Peters, Natick, Mass., 2002.

This new, completely revised edition of a classic text introduces all elements necessary for understanding Wiles' proof, as well as new developments and unsolved problems. Written by two distinguished mathematicians, this book weaves together the historical development of the subject with a presentation of mathematical techniques. The result is a solid introduction to one of the most active research areas of mathematics for serious math buffs and a textbook accessible to undergraduates.

### *Géométrie algébrique*

Olivier DEBARRE. — **Higher-dimensional algebraic geometry.** — Universitext. — Un vol. relié,  $17 \times 24$ , de XIII, 233 p. — ISBN 0-387-95227-6. — Prix: € 44.95. — Springer, New York, 2001.

The book studies the classification theory of algebraic varieties. This very active area of research is still developing, but an amazing quantity of knowledge has accumulated over the past twenty years. The author's goal is to provide an easily accessible introduction to the subject. The book begins with preparatory and standard definitions and results, moves on to discuss various aspects of the geometry of smooth projective varieties with many rational curves, and finishes in taking the first steps towards Mori's minimal model program of classification of algebraic varieties by proving the cone and contraction theorems.

Gennady LYUBEZNIK, (Editor). — **Local cohomology and its applications.** — Lecture notes in pure and applied mathematics, vol. 226. — Un vol. broché,  $18 \times 26$ , de IX, 342 p. — ISBN 0-8247-0741-9. — Prix: US\$150.00. — Marcel Dekker, New York, 2002.

This volume collects presentations from the International Workshop on Local Cohomology held in Guanajuato, Mexico, including expanded lectures notes of two minicourses on applications in equivariant topology and foundations of duality theory, and chapters on finiteness properties,  $D$ -modules, monomial ideals, combinatorial analysis, and related topics – providing survey articles of interest to experts and novices on recent developments in local cohomology and cohomology of projective schemes. The book discusses the Greenlees-May duality, algorithmic methods, cohomological Hilbert functions, equivariant  $K$ -theory, associated primes, squarefree modules, the Čech hull, residue methods... and more.