Géométrie algébrique

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and coding theorists. Recently, the authors discovered another important application of algebraic curves over finite fields with many rational points, namely to the construction of low-discrepancy sequences. These sequences are needed for numerical methods in areas as diverse as computational physics and mathematical finance. This has given additional impetus to the theory of, and the search for, algebraic curves over finite fields with many rational points.

Alexei SKOROBOGATOV. — **Torsors and rational points.** — Cambridge tracts in mathematics, vol. 144. — Un vol. relié, 16×24, de VIII, 187 p. — ISBN 0-521-80237-7. — Prix: £35.00. — Cambridge University Press, Cambridge, 2001.

The classical descent on curves of genus one can be interpreted as providing conditions on the set of rational points of an algebraic variety X defined over a number field, viewed as a subset of its adelic points. This is a natural set-up of the Hasse principle and various approximation properties of rational points. This book represents the first detailed exposition of: The general theory of torsors with key examples. – The relation of descent to the Manin obstruction. – Applications of descent to conic bundles, to bielliptic surfaces, and to homogenous spaces of algebraic groups.

Corps et polynômes

Jean-Pierre TIGNOL. — **Galois' theory of algebraic equations.** — Un vol. broché, 15,5×21,5, de XIII, 333 p. — ISBN 981-02-4541-6. — Prix: £26.00. — World Scientific, Singapore, 2001.

Galois' Theory of Algebraic Equations gives a detailed account of the development of the theory of algebraic equations, from its origins in ancient times to its completion by Galois in the nineteenth century. The main emphasis is placed on equations of at least the third degree, i.e. on the developments during the period from the sixteenth to the nineteenth century. The appropriate parts of works by Cardano, Lagrange, Vandermonde, Gauss, Abel and Galois are reviewed and placed in their historical perspective, with the aim of conveying to the reader a sense of the way in which the theory of algebraic equations has evolved and has led to such basic mathematical notions as "group" and "field". A brief discussion of the fundamental theorems of modern Galois theory is included. Complete proofs of the quoted results are provided, but the material has been organized in such a way that the most technical details can be skipped by readers who are interested primarily in a broad survey of the theory. This book will appeal to both undergraduate and graduate students in mathematics and the history of science, and also to teachers and mathematicians who wish to obtain a historical perspective of the field.

Géométrie algébrique

Chris GODSIL, Gordon ROYLE. — **Algebraic graph theory.** — Graduate texts in mathematics, vol. 207. — Un vol. relié, 16,5×24, de XIX, 439 p. — ISBN 0-387-95241-1. — Prix: DM 149.00. — Springer, New York, 2001.

Algebraic graph theory is a combination of two strands. The first is the study of algebraic objects associated with graphs. The second is the use of tools from algebra to derive properties of graphs. The authors' goal has been to present and illustrate the main tools and ideas of algebraic graph theory, with an emphasis on current rather than classical topics. While placing a strong emphasis on concrete examples they tried to keep the treatment self-contained. A substan-

tial proportion of the book covers topics that have not appeared in book form before, and as such it provides an accessible introduction to the research literature and to important open questions in modern algebraic graph theory.

V. LAKSHMIBAI, N. GONCIULEA. — **Flag varieties.** — Actualités mathématiques. — Un vol. broché, 17×24, de 332 p. — ISBN 2-7056-6389-4. — Prix: FF 220.00. — Hermann, Paris, 2001.

Flag varieties constitute an important class of homogeneous spaces. Because of their rich geometry and combinatorics, they represent fundamental objects in the areas of algebraic geometry, algebraic groups and representation theory. This book provides an introduction to the subject, and presents the interplay of flag varieties among geometry, combinatorics and representation theory. The central theme of this book is the theory of Schubert varieties – their geometric properties, ideal theory, singularity theory. This book also presents the relationship between Schubert varieties and certain affine varieties – classical determinantal varieties, ladder determinantal varieties, quiver varieties, varieties of complexes, certain affine toric varieties.

Silvio LEVY, (Editor). — **The eightfold way: the beauty of Klein's quartic curve.** — Mathematical Sciences Research Institute Publications, vol. 35. — Un vol. broché, 16×23,5, de X, 331 p. — ISBN 0-521-00419-5 (relié: 0-521-66066-1). — Prix: £19.95 (relié: £40.00). — Cambridge University Press, Cambridge, 2001.

The German mathematician Felix Klein discovered in the 1870s that the surface that we now call the Klein quartic has many remarkable properties, including an incredible 336-fold symmetry, the maximum possible degree of symmetry for any surface of its type. Since then, mathematicians have discovered that the same object comes up in different guises in many areas of mathematics, from complex analysis and geometry to number theory. This volume seeks to explore the rich tangle of properties and theories surrounding this multiform object. It includes expository and research articles by renowned mathematicians in different fields. It also includes a beautifully illustrated essay by the mathematical sculptor Helaman Ferguson, who distilled some of the beauty and remarkable properties of this surface into a sculpture entitled 'The Eightfold Way'. The book closes with the first English translation of Klein's seminal article on this surface.

Algèbre linéaire et multilinéaire, théorie des matrices

Pertti LOUNESTO. — **Clifford algebras and spinors.** — Second edition. — London Mathematical Society lecture note series, vol. 286. — Un vol. broché, 15,5×23, de IX, 338 p. — ISBN 0-521-00551-5. — Prix: £29.95. — Cambridge University Press, Cambridge, 2001.

In this book, the author offers a unique introduction to Clifford algebras and spinors. The initial chapters could be read by undergraduates; vectors, complex numbers and quaternions are introduced with an eye on Clifford algebras. The next chapters will also interest physicists, and include treatments of the quantum mechanics of the electron, electromagnetism and special relativity with a flavour of Clifford algebras. This book also gives the first comprehensive survey of recent research on Clifford algebras. A new classification of spinors is introduced, based on bilinear covariants of physical observables. This reveals a new class of spinors, residing between the Weyl, Majorana and Dirac spinors. Scalar products of spinors are classified by involutory anti-automorphisms of Clifford algebras. This leads to the chessboard of automorphism groups of scalar products of spinors.