

Anneaux et algèbres

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Qing LIU. — **Algebraic geometry and arithmetic curves.** — Translated by Reinie Ern . — Oxford graduate texts in mathematics, vol. 6. — Un vol. reli , 16,5 × 24, de xv, 576 p. — ISBN 0-19-850284-2. — Prix:  45.00. — Cambridge University Press, Cambridge, 2002.

The first part introduces basic objects such as schemes, morphisms, base change, local properties (normality, regularity, Zariski’s Main Theorem). This is followed by the more global aspects: coherent sheaves and a finiteness theorem for their cohomology groups. Then follows a chapter on sheaves of differentials, dualizing sheaves, and Grothendieck’s duality theory. The first part ends with the theorem of Riemann-Roch and its application to the study of smooth projective curves over a field. Singular curves are treated through a detailed study of the Picard group. The second part starts with blowing-ups and desingularisation (embedded or not) of fibered surfaces over a Dedekind ring that leads on to intersection theory on arithmetic surfaces. Castelnuovo’s criterion is proved and also the existence of the minimal regular model. This leads to the study of reduction of algebraic curves. The case of elliptic curves is studied in detail. The book concludes with the fundamental theorem of stable reduction of Deligne-Mumford. The book is essentially self-contained, including the necessary material on commutative algebra.

Emmanuel PEYRE, Yuri TSCHINKEL, (Editors). — **Rational points on algebraic varieties.** — Progress in mathematics, vol. 199. — Un vol. reli , 16 × 24, de xvi, 446 p. — ISBN 3-7643-6612-5. — Prix: SFr. 128.00. — Birkh user, Basel, 2002.

This book is devoted to the study of rational and integral points on higher-dimensional algebraic varieties. It contains carefully selected research papers addressing the arithmetic geometry of varieties which are not of general type, with an emphasis on how rational points are distributed with respect to the classical, Zariski and adelic topologies. The present volume gives a glimpse of the state of the art of this rapidly expanding domain in arithmetic geometry. The techniques involve explicit geometric constructions, ideas from the minimal model program in algebraic geometry as well as analytic number theory and harmonic analysis on adelic groups.

Anneaux et alg bres

Ken A. BROWN, Ken R. GOODEARL. — **Lectures on algebraic quantum groups.** — Advanced courses in mathematics CRM Barcelona. — Un vol. broch , 17 × 24, de ix, 348 p. — ISBN 3-7643-6714-8. — Prix: SFr. 59.00. — Birkh user, Basel, 2002.

This book consists of an expanded set of lectures on algebraic aspects of quantum groups, concentrating particularly on quantized coordinate rings of algebraic groups and spaces and on quantized enveloping algebras of semisimple Lie algebras. The approach, a mixture of introductory textbook, lecture notes, and overview survey, is designed to allow access by graduate students and by researchers new to the areas, as well as by experts, and to provide a basis for further study of the subject. Thus, large parts of the material are developed in full textbook style, with many examples and numerous exercises; other portions are discussed with sketches of proofs, while still other material is quoted without proof. Much associated background material is outlined in a series of appendices. Among the topics covered for the first time in book format are a discussion of the nature of the prime spectrum of a “generic” quantum algebra, and details of how the Hopf algebra structure of the algebra and the Poisson algebra structure of the center carry important consequences for quantized algebras when the quantum parameter is a root of unity. The book is structured in three parts: one introductory part with many examples plus background material, one concentrating on generic quantized coordinate, and one dealing with quantized algebras at roots of unity.

Marco FONTANA, Salah-Eddine KABBAJ, Sylvia WIEGAND, (Editors). — **Commutative ring theory and applications: proceedings of the fourth International Conference.** — Lecture notes in pure and applied mathematics, vol. 231. — Un vol. broché, $17,5 \times 25$, de XII, 499 p. — ISBN 0-8247-0855-5. — Prix: US\$ 185.00. — Marcel Dekker, New York, 2002.

Featuring presentations from the fourth International Conference on Commutative Algebra held in Fez, Morocco, this reference presents recent breakthroughs and new trends in the growing area of commutative algebra—emphasizing innovative applications and connections to algebraic number theory and geometry, and homological and computational algebra. This book discusses linear Diophantine equations... going-down and going-up properties... graded modules and analytic spread... Gröbner bases and computational methods... Krull domains and generalizations... prime spectra and dimension theory, and covers algebroïd curves and chain conditions... ideal and modules... integral independence... pullbacks and ultraproducts... tight closure and completions... and power series and polynomial rings.

Susan MONTGOMERY, Hans-Jürgen SCHNEIDER, (Editors). — **New directions in Hopf algebras.** — Mathematical Sciences Research Institute publications, vol. 43. — Un vol. relié, $16,5 \times 24$, de X, 485 p. — ISBN 0-521-81512-6. — Prix: £55.00. — Cambridge University Press, Cambridge, 2002.

Hopf algebras have important connections to quantum theory, Lie algebras, knot and braid theory, operator algebras, and other areas of physics and mathematics. The contributors to this volume of expository papers were participants in the Hopf Algebras Workshop held at MSRI as part of the 1999-2000 Year of Noncommutative Algebra. Together the papers give a clear picture of the current trends in this active field, with a focus on what is likely to be important in future research. Among the topics covered are results toward the classification of finite-dimensional Hopf algebras (semisimple and non-semisimple), as well as what is known about the extension theory of Hopf algebras. Some papers consider the Hopf version of classical topics, such as the Brauer group, while others are closer to recent work in quantum groups. The book explores the connections and applications of Hopf algebras to other fields.

***K*-théorie**

Bruce A. MAGURN. — **An algebraic introduction to *K*-theory.** — Encyclopedia of mathematics and its applications, vol. 87. — Un vol. relié, $16,5 \times 24$, de XIV, 676 p. — ISBN 0-521-80078-1. — Prix: £75.00. — Cambridge University Press, Cambridge, 2002.

This book is an introduction to *K*-theory and a text in algebra. These two roles are entirely compatible. On the one hand, nothing more than the basic algebra of groups, rings, and modules is needed to explain the classical algebraic *K*-theory. On the other hand, *K*-theory is a natural organizing principle for the standard topics of a second course in algebra, and these topics are presented carefully here, with plenty of exercises at the end of each short section. The reader will not only learn algebraic *K*-theory, but also Dedekind domains, classic groups, semisimple rings, character theory, quadratic forms, tensor products, localization, completion, tensor algebras, symmetric algebras, central simple algebras, and Brauer groups.

Alain VALETTE. — **Introduction to the Baum-Connes conjecture.** — From notes taken by Indira Chatterji, with an appendix by Guido Mislin. — Lectures in mathematics, ETH Zürich — Un vol. broché, 17×24 , de X, 104 p. — ISBN 3-7643-6706-7. — Prix: SFr. 33.00. — Birkhäuser, Basel, 2002.

The Baum-Connes conjecture can be viewed as a conjectural generalisation of the Atiyah-Singer index theorem, to the equivariant setting (the ambient manifold is not compact, but some