

# Géométrie algébrique

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geometry. Many of the leaders in the subject were brought together to present an account of research in the last century as well as speculations for possible further research. The papers in this volume cover a broad spectrum of number theory including geometric, algebrao-geometric and analytic aspects. This volume will appeal to number theorists, algebraic geometers, and geometers with a number theoretic background and to mathematicians (research students) who are interested in being informed in the state of number theory today and in possible developments for the future.

### *Corps et polynômes*

Helmut KOCH. — **Galois theory of  $p$ -extensions**. — Springer monographs in mathematics. — Un vol. relié, 16×24, de XIII, 190 p. — ISBN 3-540-43629-4. — Prix: € 69.95. — Springer, Berlin, 2002.

First published in German in 1970 and translated into Russian in 1973, this classic now becomes available in English. After introducing the theory of pro- $p$  groups and their cohomology, it discusses presentations of the Galois groups  $G_S$  of maximal  $p$ -extensions of number fields that are unramified outside a given set  $S$  of primes. It computes generators and relations as well as the cohomological dimension of some  $G_S$ , and gives applications to infinite class field towers. The book demonstrates that the cohomology of groups is very useful for studying Galois theory of numbers fields; at the same time, it offers a down to earth introduction to the cohomological method.

### *Géométrie algébrique*

M.C. BELTRAMETTI, F. CATANESE, C. CILIBERTO, A. LANTERI, C. PEDRINI. — **Algebraic geometry: a volume in memory of Paolo Francia**. — Un vol. relié, 18×24,5, de x, 355 p. — ISBN 3-11-017180-5. — Prix: € 138.32. — Walter de Gruyter, Berlin, 2002.

The volume consists of invited refereed papers dedicated to the memory of Paolo Francia, who was an outstanding mathematician at the University of Genoa where he held a chair of geometry. The contributions cover a wide spectrum of algebraic geometry, ranging from motives theory to numerical algebraic geometry, and are mainly focused on higher dimensional varieties and minimal model program, and also on surfaces of general type. Partly the articles are based on talks given at a Conference in Memory of Paolo Francia (1951-2000) held in Genoa in September 2001. In addition to algebraic geometers, the volume will be of interest also to researchers working in differential geometry and commutative algebra.

Anatoly LIBGOBER, Mihai TIBĂR, (Editors). — **Trends in singularities**. — Trends in mathematics. — Un vol. relié, 17×24, de IX, 246 p. — ISBN 3-7643-6704-0. — Prix: SFr. 132.00. — Birkhäuser, Basel, 2002.

The collection of papers in this volume represents recent advances in the geometry and topology of singularities. Written by well-known specialists, the articles cover a broad range of topics that provide a focus for ongoing research and investigation. The contributions discuss local as well as global aspects, endowing the reader with an overview on the present state of the art. The volume is intended for a large audience in pure and applied mathematics, including researchers and graduate students working in algebraic geometry, singularity theory, topology and related fields. The reader will find up-to-date information on a wide variety of contemporary problems involving singularities.

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.