

# Corps et polynômes

Objektyp: **Chapter**

Zeitschrift: **L'Enseignement Mathématique**

Band (Jahr): **44 (1998)**

Heft 1-2: **L'ENSEIGNEMENT MATHÉMATIQUE**

PDF erstellt am: **21.07.2024**

## **Nutzungsbedingungen**

Die ETH-Bibliothek ist Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Inhalten der Zeitschriften. Die Rechte liegen in der Regel bei den Herausgebern.

Die auf der Plattform e-periodica veröffentlichten Dokumente stehen für nicht-kommerzielle Zwecke in Lehre und Forschung sowie für die private Nutzung frei zur Verfügung. Einzelne Dateien oder Ausdrucke aus diesem Angebot können zusammen mit diesen Nutzungsbedingungen und den korrekten Herkunftsbezeichnungen weitergegeben werden.

Das Veröffentlichen von Bildern in Print- und Online-Publikationen ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Die systematische Speicherung von Teilen des elektronischen Angebots auf anderen Servern bedarf ebenfalls des schriftlichen Einverständnisses der Rechteinhaber.

## **Haftungsausschluss**

Alle Angaben erfolgen ohne Gewähr für Vollständigkeit oder Richtigkeit. Es wird keine Haftung übernommen für Schäden durch die Verwendung von Informationen aus diesem Online-Angebot oder durch das Fehlen von Informationen. Dies gilt auch für Inhalte Dritter, die über dieses Angebot zugänglich sind.

chapters are devoted to the Abelian case (complex multiplication), where one finds a nice correspondence between the  $l$ -adic representations and the linear representations of some algebraic groups (now called “Taniyama groups”). The last chapter handles the case of elliptic curves with no complex multiplication, the main result of which is that the image of the Galois group (in the corresponding  $l$ -adic representation) is large.

John STILLWELL. — **Numbers and geometry.** — Undergraduate texts in mathematics. Readings in mathematics. — Un vol. relié,  $16 \times 24$ , de XIV, 337 p. — ISBN 0-387-98289-2. — Prix : DM 68.00. — Springer, New York, 1997.

The book is an elementary account of mathematics where three main fields – algebra, analysis, and geometry – meet. The aim of this book is to give a broad view of these subjects at the level of calculus, without being a calculus (or a pre-calculus) book. Its roots are in arithmetic and geometry, the two opposite poles of mathematics, and the source of historic conceptual conflict. The resolution of this conflict, and its role in the development of mathematics, is one of the main stories in the book. The key is algebra, which brings arithmetic and geometry together, and allows them to flourish and branch out in new directions. The author elegantly combines mathematical history with mathematics.

## *Corps et polynômes*

Mohamed AYAD. — **Théorie de Galois: 122 exercices corrigés, niveau I.** — Un vol. broché,  $17,5 \times 26$ , de VIII, 181 p. — ISBN 2-7298-4796-0. — Prix : FF 120.00. — Ellipses, Paris, 1997.

Ce livre s’adresse aux étudiants de Licence-Maîtrise de mathématiques, ainsi qu’à ceux inscrits à un concours de recrutement de professeurs (CAPES, Agrégation). Il contient 122 exercices corrigés sur la théorie de Galois classique et moderne. La plupart des énoncés proposent de travailler sur des situations concrètes. Beaucoup d’énoncés illustrent le phénomène de séparabilité pour lequel peu d’exercices existent dans la littérature. Pour certaines questions, plusieurs méthodes de résolutions sont données.

Mohamed AYAD. — **Théorie de Galois: 115 exercices corrigés, niveau II.** — Un vol. broché,  $17,5 \times 26$ , de VIII, 245 p. — ISBN 2-7298-6750-3. — Prix : FF 150.00. — Ellipses, Paris, 1997.

Les énoncés proposés dans ce volume s’adressent aux étudiants de Maîtrise, D.E.A. de mathématiques ainsi qu’à ceux préparant l’Agrégation. En plus des exercices classiques, on trouvera des énoncés sur la construction de certaines extensions dont le groupe de Galois est donné, ainsi que l’exposé d’une méthode récente sur le calcul du groupe de Galois d’un polynôme. On trouvera aussi un énoncé sur l’application des bases de Gröbner au calcul du polynôme minimal. Certains énoncés illustrent des applications de la théorie de Galois à l’analyse diophantienne, à la théorie des nombres et aux polynômes à plusieurs indéterminées.

Maureen H. FENRICK. — **Introduction to the Galois correspondence.** — Second edition. — Un vol. relié,  $16 \times 24$ , de IX, 235 p. — ISBN 0-8176-4026-6. — Prix : SFr. 98.00. — Birkhäuser, Boston, 1998.

This monograph is a self-contained text book. The introductory chapter covers such topics as Sylow  $p$ -subgroups, solvable groups, and the structures of finite, abelian groups, thus providing the student with a firm foundation for the study of Galois correspondence. The Galois

correspondence itself is presented with many well constructed, concrete examples and exercises of varying degrees of difficulty. Some of the diverse applications of the Galois correspondence are presented, including the Fundamental Theorem of Algebra, the unsolvability of the general quintic, classical constructibility problems, etc...

V.V. ISHKHANOV, B.B. LUR'E, D.K. FADDEEV. — **The embedding problem in Galois theory.** — Translations of mathematical monographs, vol. 165. — Un vol. relié,  $18,5 \times 26$ , de XI, 182 p. — ISBN 0-8218-4592-6. — Prix: £65.00. — American Mathematical Society, Providence, distributed by Oxford University Press, Oxford, 1997.

The central problem of modern Galois theory involves the inverse problem: given a field  $k$  and a group  $G$ , construct an extension  $L/k$  with Galois group  $G$ . The embedding problem for fields generalizes the inverse problem and consists in finding the conditions under which one can construct a field  $L$  normal over  $k$ , with group  $G$ , such that  $L$  extends a given normal extension  $K/k$  with Galois group  $G/A$ . Moreover, the requirements applied to the object  $L$  to be found are usually weakened: it is not necessary for  $L$  to be a field, but  $L$  must be a Galois algebra over the field  $k$ , with group  $G$ . The embedding problem is a fruitful approach to the solution of the inverse problem in Galois theory.

## *Géométrie algébrique*

Shreeram S. ABHYANKAR. — **Resolution of singularities of embedded algebraic surfaces.** — Second enlarged edition. — Springer monographs in mathematics. — Un vol. relié,  $16 \times 24$ , de XII, 311 p. — ISBN 3-540-63719-2. — Prix: DM 128.00. — Springer, Berlin, 1998.

This new edition describes the geometric part of the author's 1965 proof of desingularization of algebraic surfaces and solids in nonzero characteristic. The book also provides a self-contained introduction to birational algebraic geometry, based only on basic commutative algebra. In addition, it gives a short proof of analytic desingularization in characteristic zero for any dimension found in 1996 and based on a new avatar of an algorithmic trick employed in the original edition of the book.

M.P. BRODMANN & R.Y. SHARP. — **Local cohomology: an algebraic introduction with geometric applications.** — Cambridge studies in advanced mathematics, vol. 60. — Un vol. relié,  $16 \times 24$ , de XV, 416 p. — ISBN 0-521-37286-0. — Prix: £45.00. — Cambridge University Press, Cambridge, 1998.

The book provides a careful and detailed algebraic introduction to Grothendieck's local cohomology theory, and provides many illustrations of applications of the theory in commutative algebra and in the geometry of quasi-affine and quasi-projective varieties. Topics covered include Castelnuovo-Mumford regularity, the Fulton-Hansen connectedness theorem for projective varieties, and connections between local cohomology and both reductions of ideals and sheaf cohomology.

Robert FRIEDMAN. — **Algebraic surfaces and holomorphic vector bundles.** — Universitext. — Un vol. relié,  $16 \times 24$ , de IX, 328 p. — ISBN 0-387-98361-9. — Prix: DM 88.00. — Springer, New York, 1998.

A novel feature of the book is its integrated approach to algebraic surface theory and the study of vector bundle theory on both curves and surfaces. While the two subjects remain separate though the first few chapters, and are studied in alternate chapters, they become much