

# Algèbre linéaire et Multilinéaire, théorie des matrices

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more tightly interconnected as the book progresses. Thus vector bundles over curves are studied to understand ruled surfaces, and then reappear in the proof of Bogomolov's inequality for stable bundles, which is itself applied to study canonical embeddings of surfaces via Reider's method. Similarly, ruled and elliptic surfaces are discussed in detail, and then the geometry of vector bundles over such surfaces is analyzed.

K.H. KAMPS, T. PORTER. — **Abstract homotopy and simple homotopy theory.** — Un vol. relié, 16,5 × 22,5, de IX, 462 p. — ISBN 981-02-1602-5. — Prix: £61.00. — World Scientific, Singapore, 1997.

The book is designed to allow entry into a beautifully rich area which can be loosely called abstract homotopy theory. It can also provide a non-conventional approach to ordinary homotopy theory as the authors feel it makes explicit parts of that theory that are obscured by the particularities in the topological setting. The authors have tried to make it reasonably accessible to a beginning graduate student and to make it enjoyable.

Goro SHIMURA. — **Abelian varieties with complex multiplication and modular functions.** — Princeton mathematical series, vol. 46. — Un vol. relié, 16 × 24, de XIV, 217 p. — ISBN 0-691-01656-9. — Prix: US\$55.00. — Princeton University Press, Princeton, 1998.

Reciprocity laws of various kinds play a central role in number theory. In the easiest case, one obtains a transparent formulation by means of roots of unity, which are special values of exponential functions. A similar theory can be developed for special values of elliptic or elliptic modular functions, and is called complex multiplication of such functions. In this book, the author provides the most comprehensive generalizations of this type by stating several reciprocity laws in terms of abelian varieties, theta functions, and modular functions of several variables, including Siegel modular functions. This subject is closely connected with the zeta function of an abelian variety, which is also covered as a main theme in the book. The third topic explored is the various algebraic relations among the periods of abelian integral.

Kenji UENO. — **An introduction to algebraic geometry.** — Translated by Katsumi Nomizu. — Translations of mathematical monographs, vol. 166. — Un vol. relié, 18 × 26, de XII, 246 p. — ISBN 0-8218-0589-4. — Prix: £60.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

This introduction to algebraic geometry allows readers to grasp the fundamentals of the subject with only linear algebra and calculus as prerequisites. After a brief history of the subject, the book introduces projective spaces and projective varieties, and explains plane curves and resolution of their singularities. The volume further develops the geometry of algebraic curves and treats congruence zeta functions of algebraic curves over a finite field. It concludes with a complex analytical discussion of algebraic curves. The author emphasizes computation of concrete examples rather than proofs.

## ***Algèbre linéaire et multilinéaire, théorie des matrices***

Sheldon AXLER. — **Linear algebra done right.** — Undergraduate texts in mathematics. — Un vol. broché, 19,5 × 23,5, de XV, 251 p. — ISBN 0-387-98258-2. — Prix: DM 46.00. — Springer, New York, 1997.

The novel approach taken here banishes determinants to the end of the book and focuses on the central goal of linear algebra: understanding the structure of linear operators on vector spaces. The author has taken unusual care to motivate concepts and to simplify proofs. A variety of

interesting exercises in each chapter helps students understand and manipulate the objects of linear algebra. No prerequisites are assumed other than the usual demand for suitable mathematical maturity. This second edition includes a new section on orthogonal projections and minimization problems. The sections on self-adjoint operators, normal operators, and the spectral theorem have been rewritten.

Richard KAYE and Robert WILSON. — **Linear algebra**. — Oxford science publications. — Un vol. relié,  $16 \times 24$ , de XI, 230 p. — Prix: £35.00. — ISBN 0-19-850238-9. — Oxford University Press, Oxford, 1998.

This book provides a complete account of undergraduate linear algebra suitable for students with no prior exposure to abstract algebra. The approach is rigorous, without being unnecessarily abstract. It covers matrices, vector spaces, bases, and dimensions, inner products, bilinear and sesquilinear forms on vector spaces, linear transformations, eigenvalues, eigenvectors, diagonalization, Jordan normal form. Abstract methods are illustrated with concrete examples throughout, and more detailed examples highlight applications of linear algebra to analysis, geometry, differential equations, relativity, and quantum mechanics.

Richard C. PENNEY. — **Linear algebra: ideas and applications**. — Un vol. relié,  $19,5 \times 24$ , de XVI, 382 p. — ISBN 0-471-18179-X. — Prix: £24.50. — John Wiley, Chichester, 1998.

This book explores linear algebra using an approach that introduces abstract concepts only as they are needed to understand the computations. No new concept is introduced without first justifying its importance and relationship to something which is already in the readers' sphere of experience, allowing readers to see immediately why each concept is necessary. This approach ensures that the relation between theory and application is clear and immediate. — *Contents*: Systems of Linear Equations. Linear Independence and Dimension. Linear Transformations. Orthogonality. Determinants. Diagonalization and Matrix Representations. Chapter summary. Answers and Hints to Odd-Numbered Exercises.

## *Anneaux et algèbres*

Bruno BUCHBERGER, Franz WINKLER, (Editors). — **Gröbner bases and applications**. — London Mathematical Society lecture note series, vol. 251. — Un vol. broché,  $15 \times 23$ , de VIII, 552 p. — ISBN 0-521-63298-6. — Prix: £29.95. — Cambridge University Press, Cambridge, 1998.

This book provides a short and easy-to-read account of the theory of Gröbner bases and its applications. It is in two parts, the first consisting of tutorial lectures, beginning with a general introduction. The subject is then developed in a further 12 tutorials, written by leading experts, on the application of Gröbner bases in various fields of mathematics. In the second part are 17 original research papers on Gröbner bases. An appendix contains the English translations of the original German papers of Bruno Buchberger in which Gröbner bases were introduced.

Stefaan CAENEPEEL, Alain VERSCHOREN, (Editors). — **Rings, Hopf algebras, and Brauer groups**. — Proceedings of the fourth week on algebra and algebraic geometry. — Pure and applied mathematics, vol. 197. — Un vol. broché,  $18 \times 25,5$ , de X, 332 p. — ISBN 0-8247-0153-4. — Prix: US\$175.00. — Marcel Dekker, New York, 1998.

Based on papers presented at a recent international conference on algebra and algebraic geometry, this book presents both survey and research articles featuring new results from the