Jerzy WEYMAN. — **Cohomology of vector bundles and syzygies.** — Cambridge tracts in mathematics, vol. 149. — Un vol. relié, 16×23, de XIV, 371 p. — ISBN 0-521-62197-6. — Prix: £55.00. — Cambridge University Press, Cambridge, 2003.

The central theme of this book is an exposition of the geometric technique of calculating syzygies. It is written from the point of view of commutative algebra; without assuming any knowledge of representation theory, the calculation of syzygies of determinantal varieties is explained. The starting point is a definition of Schur functors, and these are discussed from both an algebraic and a geometric point of view. Then a chapter on various versions of Bott's theorem leads to a careful explanation of the technique itself, based on a description of the direct image of a Koszul complex. Applications to determinantal varieties follow. There are also chapters on applications of the technique to rank varieties for symmetric and skew symmetric tensors of arbitrary degree, closures of conjugacy classes of nilpotent matrices, discriminants, and resultants. Numerous exercises are included to give the reader insight into how to apply this important method.

K-théorie

Guido MISLIN, Alain VALETTE. — **Proper group actions and the Baum-Connes conjecture.** — Advanced courses in mathematics, CRM Barcelona. — Un vol. broché, 17×24, de VII, 131 p. — ISBN 3-7643-0408-1. — Prix: SFr. 44.00. — Birkhäuser, Basel, 2003.

This book contains a concise introduction to the techniques used to prove the Baum-Connes conjecture. The Baum-Connes conjecture predicts that the K-homology of the reduced C*-algebra of a group can be computed as the equivariant K-homology of the classifying space for proper actions. The approach is expository, but it contains proofs of many basic results on topological K-homology and the K-theory of C*-algebras. It features a detailed introduction to Bredon homology for infinite groups, with applications to K-homology. It also contains a detailed discussion of naturality questions concerning the assembly map, a topic not well documented in the literature.

Théorie des groupes et généralisations

Jung Rae CHO, Jens MENNICKE, (Editors). — **Recent advances in group theory and low-dimensional topology.** — Research and exposition in mathematics, vol. 27. — Un vol. broché, 17×24, de 181 p. — ISBN 3-88538-227-X. — Prix: €30.00. — Heldermann Verlag, Lemgo, 2003.

This volume presents a selection of worked-out lectures that were held at the 2nd German-Korean Workshop on Algebra and Topology which took place at Pusan, Korea, in August 2000. The papers present surveys and new results that have not been published elsewhere. — *Contents:* P. Ackermann, M. Näätänen, G. Rosenberger: The arithmetic Fuchsian groups with signature $(0; 2,2,2,q)$. — R. Brown, M. Bullejos, T. Porter: Crossed complexes, free crossed resolutions and graph products of groups. — C.M. Campbell, P.P. Campbell, B.T.K. Hopson, E.F. Robertson: On the efficiency of direct powers of $PGL(2p)$. — D.A. Derevnin, Ann Chi Kim: The Coxeter prism in H^3. — D. Hennig, G. Rosenberger: Recent developments in the theory of Fuchsian and Kleinian groups. — Ann Chi Kim, Yangkok Kim: On generalized Whitehead links and 3-manifolds. — Jae-Ryong Kim, Moo Ha Woo: Topology fields and fixed points of flows. — E. Kudryavtseva, R. Weidmann, H. Zieschang: Quadratic equations in free groups and topological applications. — A. Mednykh, A. Vesnin: Colourings of polyhedra and hyperelliptic

3-manifolds. — J. Mennicke: Linear groups over rings of integers. — Ch. Menzel, J.R. Parker: Pseudo-Anosov diffeomorphisms of the twice punctured torus. — M. Mulazzani: 3-manifolds with cyclic symmetry and (1,1)-knots. — A. Szczepański: Holonomy groups of crystallographic groups with finite outer automorphism groups. — K.-I. Tahara: Survey on dimension subgroup problem.

Groupes topologiques; groupes et algèbres de Lie

Brian C. HALL. — **Lie groups, Lie algebras, and representations: an elementary introduction.** — Graduate texts in mathematics, vol. 222. — Un vol. relié, 16×24, de XIV, 351 p. — ISBN 0-387-40122-9. — Prix: € 64.95. — Springer, New York, 2003.

This book addresses Lie groups, Lie algebras, and representation theory. In order to keep the prerequisites to a minimum, the author restricts attention to matrix Lie groups and Lie algebras. This approach keeps the discussion concrete, allows the reader to get to the heart of the subject quickly, and covers all the most interesting examples. The book introduces the often-intimidating machinery of roots and the Weyl group in a gradual way, using examples and representation theory as motivation. The first part of the text covers Lie groups and Lie algebras and the relationship between them, along with basic representation theory. The second covers the theory of semisimple Lie groups and Lie algebras, beginning with a detailed analysis of the representations of SU(3). The author illustrates the general theory with numerous images pertaining to Lie algebras of rank two and rank three, including images of root systems, lattices of dominant integral weights, and weight diagrams. This book is sure to become a standard textbook for graduate students in mathematics and physics with little or no prior exposure to Lie theory.

Shrawan KUMAR. — **Kac-Moody groups, their flag varieties and representation theory.** — Progress in mathematics, vol. 204. — Un vol. relié, 16,5×24, de XIII, 606 p. — ISBN 0-8176-4227-7. — Prix: € 159.00. — Birkhäuser, Boston, 2002.

Kac-Moody (K-M) groups are a standard tool in mathematics and mathematical physics having undergone tremendous developments in various directions over the last decades. K-M theory has indeed made profound connections with such diverse areas as number theory, combinatorics, topology, moduli of vector bundles, singularities, quantum groups, completely integrable systems, and mathematical physics. — *Key features:* A comprehensive, well-written exposition of K-M theory, moving the reader in a systematic fashion from K-M Lie algebras to the broader group setting; in particular, the algebro-geometric, topological and representation-theoretic aspects of K-M theory are treated. — No prior knowledge of K-M Lie algebras or of (finite-dimensional) algebraic groups is required. — Several examples, an extensive bibliography, and thorough index. — Numerous exercises, some with hints, at the end of each section. — Challenging open problems. — A self-contained text containing material not available elsewhere in book form.

Fonctions d'une variable complexe

Mark J. ABLOWITZ, Athanassios S. FOKAS. — **Complex variables: introduction and applications.** — Second edition. — Cambridge texts in applied mathematics. — Un vol. broché, 15×23, de XII, 647 p. — ISBN 0-521-53429-1. — Prix: £29.95. — Cambridge University Press, Cambridge, 2003.

Part I of this text provides an introduction to the subject, including analytic functions, integration, series, and residue calculus. It also includes transform methods, ordinary differential