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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,  $16 \times 24$ , 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,  $16,5 \times 24$ , 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,  $15 \times 23$ , 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

equations in the complex plane, numerical methods, and more. Part II contains conformal mappings, asymptotic expansions, and the study of Riemann-Hilbert problems. The authors also provide an extensive array of applications, illustrative examples, and homework exercises. The new edition has been improved throughout and is ideal for use in introductory undergraduate level courses in complex variables.

John Mackintosh HOWIE. — **Complex analysis.** — Springer undergraduate mathematics series. — Un vol. broché,  $18 \times 24$ , de XI, 260 p. — ISBN 1-85233-733-8. — Prix: €29.95. — Springer, London, 2003.

This book takes account of the varying needs and backgrounds and provides a self-study text for students in mathematics, science and engineering. Beginning with a summary of what the student needs to know at the outset, it covers all the topics likely to feature in a first course in the subject, including: complex numbers, differentiation, integration, Cauchy's theorem and its consequences, applications of contour integration, Laurent series and the residue theorem, conformal mappings and harmonic functions. A brief final chapter explains the Riemann hypothesis, the most celebrated of all the unsolved problems in mathematics, and ends with a short descriptive account of iteration, Julia sets and the Mandelbrot set. Clear and careful explanations are backed up with worked examples and more than 100 exercises, for which full solutions are provided.

### *Fonctions de plusieurs variables complexes*

James CARLSON, Stefan MÜLLER-STACH, Chris PETERS. — **Period mappings and period domains.** — Cambridge studies in advanced mathematics, vol. 85. — Un vol. relié,  $16 \times 23,5$ , de XVI, 430 p. — ISBN 0-521-81466-9. — Prix: £65.00. — Cambridge University Press, Cambridge, 2003.

The basic theory as developed by Griffiths is explained in the first part of the book. Then, in the second part spectral sequences and Koszul complexes are introduced and are used to derive results about cycles on higher dimensional algebraic varieties such as the Noether-Lefschetz theorem and Nori's theorem. Finally, in the third part differential geometric methods are explained leading up to proofs of Arakelov-type theorems, the theorem of the fixed part, the rigidity theorem, and more. Higgs bundles and relations to harmonic maps are discussed, and this leads to striking results such as the fact that compact quotients of certain period domains can never admit a Kähler metric or that certain lattices in classical Lie groups can't occur as the fundamental group of a Kähler manifold.

Ian GRAHAM, Gabriela KOHR. — **Geometric function theory in one and higher dimensions.** — Monographs and textbooks in pure and applied mathematics, vol. 255. — Un vol. relié,  $15,5 \times 23,5$ , de XV, 530 p. — ISBN 0-8247-0976-4. — Prix: US\$185.00. — Marcel Dekker, New York, 2003.

This text/reference is the first book to combine classical results in univalent complex function theory and generalizations of these results to several complex variables. It presents a unique overview of current progress in the field, including the authors' personal research detailing valuable results that lead to improvements in existence theorems for the Loewner differential equation in higher dimensions. Focusing on growth, distortion, covering theorems, and coefficient estimates, this book discusses the compactness of the analog of the Carathéodory class in several variables... offers a detailed study of Loewner chains in one variable and in several variables... studies various classes of univalent mappings according to their geometrical