Théorie des groupes et généralisation

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concept of zero square, or nilpotent infinitesimal – that is, a quantity so small that its square and all higher powers can be set, literally to zero. As we show, the systematic employment of these infinitesimals reduces the differential calculus to simple algebra and at the same time, restores to use the infinitesimal methods figuring in traditional applications of the calculus to physical problems.

Théorie des groupes et généralisation

Robert CURTIS, Robert WILSON, (Editors). — **The Atlas of finite groups: ten years on.** — London Mathematical Society lecture note series, vol. 249. — Un vol. broché, 15,5×23, de XIII, 293 p. — ISBN 0-521-57587-7. — Prix: £27.95. — Cambridge University Press, Cambridge, 1998.

This book is a proceedings of a conference organised to mark the tenth anniversary of the publication of the *Atlas*, and contains twenty articles by leading experts in the field, covering many aspects of group theory and its applications. There are surveys on recent developments, expository articles, and research papers, as well as a historical article on the development of the *Atlas* project since 1970. The book emphasises recent advances in group theory and applications which have been stimulated by the comprehensive collection of information contained in the *Atlas*, and covers both theoretical and computational aspects of finite groups, modular representation theory, presentations, and applications to the study of surfaces.

Bertram HUPPERT. — **Character theory of finite groups.** — De Gruyter expositions in mathematics, vol. 25. — Un vol. relié, 17,5×24,5, de VI, 618 p. — ISBN 3-11-015421-8. — Prix: DM 328.00. — Walter de Gruyter, Berlin, 1998.

Based on the classical results by Frobenius, Burnside, and Schur character theory makes a central contribution to the complete classification of finite simple groups. This book serves as a modern introduction to this important part of group theory. In the first sections it develops the theory from the very beginning. Clifford theory is presented in great detail. Other topics covered are Frobenius groups, length of conjugacy classes and character degrees and derived length, groups with a small number of character degrees, etc. A special feature of the book is the inclusion of many examples, mostly of solvable groups, whose character tables in character degrees are determined.

Peter H. KROPHOLLER, Graham A. NIBLO and Ralph STÖHR, (Editors). — **Geometry and cohomology in group theory.** — London Mathematical Society lecture note series, vol. 252. — Un vol. broché, 15,5×23, de XII, 316 p. — ISBN 0-521-63556-X. — Prix: £24.95. — Cambridge University Press, Cambridge, 1998.

This volume reflects the fruitful connections between group theory and topology. It contains articles on cohomology, representation theory, and geometric and combinatorial group theory. Some of the world's best-known figures in this very active area of mathematics have made contributions, including substantial articles from Ol'shanskii, Mikhajlovskii, Carlson, Benson, Linnell, Wilson and Grigorchuk which will be valuable reference works for some years to come.

Gabriel NAVARRO. — **Characters and blocks of finite groups.** — London Mathematical Society lecture note series, vol. 250. — Un vol. broché, 15,5×23, de X, 287 p. — ISBN 0-521-59513-4. — Prix: £24.95. — Cambridge University Press, Cambridge, 1998.

This is an accessible and up to date exposition of modular representation theory of finite groups from a character theoretic viewpoint. The early chapters introduce Brauer characters and blocks and develop their basic properties. The next three chapters study and prove Brauer's first, second and third main theorems in turn. These results are then applied to prove a major

application of finite groups, the Glauberman Z^*-theorem. Later chapters examine Brauer characters in more detail. The relationship between blocks and normal subgroups is also explored and the modular characters and blocks in p-solvable group are discussed. Finally, the character theory of groups with a Sylow p-subgroup of order p is studied. Each chapter concludes with a set of problems.

Groupes topologiques; groupes et algèbres de Lie

Roger W. CARTER and Meinolf GECK, (Editors). — **Representations of reductive groups.** — Publications of the Newton Institute. — Un vol. relié, 15,5×23, de VIII, 191 p. — ISBN 0-521-64325-2. — Prix: £35.00. — Cambridge University Press, Cambridge, 1998.

The articles in this volume provide introductions to various aspects of the representation theory of reductive algebraic groups and related finite reductive groups, including algebraic groups and Lie algebras, reflection groups, abelian and derived categories, the Deligne-Lusztig representation theory of finite reductive groups, Harish-Chandra theory and its generalizations, quantum groups, subgroup structure of algebraic groups, intersection cohomology, and Lusztig's conjectured character formula for irreducible representations in prime characteristic.

Roe GOODMAN, Nolan R. WALLACH. — **Representations and invariants of the classical groups.** — Encyclopedia of mathematics and its applications, vol. 68. — Un vol. relié, 16×24, de XVI, 685 p. — ISBN 0-521-58273-3. — Prix: £65.00. — Cambridge, Cambridge University Press, 1998.

An updated version of invariant theory together with many of the important recent developments are presented in this book. As a text for those new to the area, this book provides an introduction to the structure and finite-dimensional representation theory of the complex classical groups that requires only an abstract algebra course as a prerequisite. For the more advanced reader, the book presents an introduction to the structure and representations of complex reductive algebraic groups and their compact real forms. It also serves as a reference for the main results concerning tensor and polynomial invariants and the finite dimensional representation theory of the classical groups.

Joachim HILGERT, Jimmie D. LAWSON, Karl-Hermann NEEB, Ernest B. VINBERG, (Editors). — **Positivity in Lie theory: open problems.** — De Gruyter expositions in mathematics, vol. 26. — Un vol. relié, 18×24,5, de XII, 290 p. — ISBN 3-11-016112-5. — Prix: DM 258.00. — Walter de Gruyter, Berlin, 1998.

This book consists of 15 articles, each of which is an introduction to a set of open research problems in Lie theory. The unifying theme is "positivity", which means orderings on the level of manifolds, semigroups on the level of groups, and cones on the level of linear spaces and Lie algebras. The topics range from geometric and algebraic structure theory through harmonic analysis, representation theory as far as control theory and probability. The editors of this book have tried to put together a collection of problems with commentary that would serve as an invitation and a guide to the field.

B.P. KOMRAKOV, I.S. KRASIL'SHCHIK, G.L. LITVINOV and A.B. SOSSINSKY, (Editors). — **Lie groups and Lie algebras: their representations, generalisations and applications.** — Mathematics and its applications, vol. 433. — Un vol. relié, 16×25, de VIII, 442 p. — ISBN 0-7923-4916-4. — Prix: Dfl. 340.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The present work reflects the interests of scientists associated with the International Sophus Lie Center, and provides up-to-date results in Lie groups and Lie algebras, quantum