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Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Group gradings on Lie algebras with applications to geometry. I (Y. Bahturin, M. Goze, E. Remm) -- Bounding the dimensions of rational cohomology groups (C.P. Bendel, B.D. Boe, C.M. Drupieski, D.K. Nakano, B.J. Parshall, C. Pillen, C.B. Wright) -- Representations of the general linear Lie superalgebra in the BGG Category $\{\mathcal{O}\}$ (J. Brundan) -- Three results on representations of Mackey Lie algebras (A. Chirvasitu) -- Free field realizations of the Date–Jimbo–Kashiwara–Miwa algebra (B. Cox, V. Futorny, R.A. Martins) -- The deformation complex is a homotopy invariant of a homotopy algebra (V. Dolgushev, T. Willwacher) -- Invariants of Artinian Gorenstein algebras and isolated hypersurface singularities (M.G. Eastwood, A.V. Isaev) -- Generalized loop modules for affine Kac–Moody algebras (V. Futorny, I. Kashuba) --

Twisted localization of weight modules (D. Grantcharov) -- Dirac cohomology and generalization of classical branching rules (J.-S. Huang) -- Cleft extensions and quotients of twisted quantum doubles (G. Mason, S.-H. Ng) -- On the structure of  $\mathbb{N}$ -graded vertex operator algebras (G. Mason, G. Yamskulna) -- Variations on a Casselman–Osborne theme (D. Milii) -- Tensor representations of Mackey Lie algebras and their dense subalgebras (I. Penkov, V. Serganova) -- Algebraic methods in the theory of generalized Harish–Chandra modules (I. Penkov, G. Zuckerman) -- On exceptional vertex operator (super) algebras (M.P. Tuite, H.D. Van) -- The cubic, the quartic, and the exceptional group  $G_2$  (A. van Groningen, J.F. Willenbring).

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## Sommario/riassunto

This volume reviews and updates a prominent series of workshops in representation/Lie theory, and reflects the widespread influence of those workshops in such areas as harmonic analysis, representation theory, differential geometry, algebraic geometry, and mathematical physics. Many of the contributors have had leading roles in both the classical and modern developments of Lie theory and its applications. This Work, entitled *Developments and Retrospectives in Lie Theory*, and comprising 26 articles, is organized in two volumes: *Algebraic Methods and Geometric and Analytic Methods*. This is the *Algebraic Methods* volume. The *Lie Theory Workshop* series, founded by Joe Wolf and Ivan Penkov and joined shortly thereafter by Geoff Mason, has been running for over two decades. Travel to the workshops has usually been supported by the NSF, and local universities have provided hospitality. The workshop talks have been seminal in describing new perspectives in the field covering broad areas of current research. Most of the workshops have taken place at leading public and private universities in California, though on occasion workshops have taken place in Oregon, Louisiana and Utah. Experts in representation theory/Lie theory from various parts of the Americas, Europe and Asia have given talks at these meetings. The workshop series is robust, and the meetings continue on a quarterly basis. Contributors to the *Algebraic Methods* volume: Y. Bahturin, C. P. Bendel, B.D. Boe, J. Brundan, A. Chirvasitu, B. Cox, V. Dolgushev, C.M. Drupieski, M.G. Eastwood, V. Futorny, D. Grantcharov, A. van Groningen, M. Goze, J.-S. Huang, A.V. Isaev, I. Kashuba, R.A. Martins, G. Mason, D. Milii, D.K., Nakano, S.-H. Ng, B.J. Parshall, I. Penkov, C. Pillen, E. Remm, V. Serganova, M.P. Tuite, H.D. Van, J.F. Willenbring, T. Willwacher, C.B. Wright, G. Yamskulna, G. Zuckerman.

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