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Titolo	Representations of Lie Algebras and Partial Differential Equations / / by Xiaoping Xu
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Descrizione fisica	1 online resource (XXXVI, 620 p.)
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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface.- Introduction.- I Fundament of Lie Algebras.- Preliminary of Lie Algebras.- Semisimple Lie Algebras.- Root Systems. - Isomorphisms, Conjugacy and Exceptional Types.- Highest-Weight Representation Theory.- II Explicit Representations.- Representations of Special Linear Algebras.- Representations of Even Orthogonal Lie Algebras -- Representations of Odd Orthogonal Lie Algebras -- Representations of Symplectic Lie Algebras -- Representations of G 2 and F 4 -- Representations of E6 -- Representations of E -- III Related Topics -- Oscillator Representations of gl(n | m) and osp(n | 2m) -- Representation Theoretic Codes -- Path Hypergeometric Functions -- Bibliography -- Index. .
Sommario/riassunto	This book provides explicit representations of finite-dimensional simple Lie algebras, related partial differential equations, linear orthogonal algebraic codes, combinatorics and algebraic varieties, summarizing the author’s works and his joint works with his former students. Further, it presents various oscillator generalizations of the classical representation theorem on harmonic polynomials, and

highlights new functors from the representation category of a simple Lie algebra to that of another simple Lie algebra. Partial differential equations play a key role in solving certain representation problems. The weight matrices of the minimal and adjoint representations over the simple Lie algebras of types E and F are proved to generate ternary orthogonal linear codes with large minimal distances. New multi-variable hypergeometric functions related to the root systems of simple Lie algebras are introduced in connection with quantum many-body systems in one dimension. In addition, the book identifies certain equivalent combinatorial properties on representation formulas, and the irreducibility of representations is proved directly related to algebraic varieties. The book offers a valuable reference guide for mathematicians and scientists alike. As it is largely self-contained – readers need only a minimal background in calculus and linear algebra – it can also be used as a textbook.