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Nota di contenuto	Preface -- Introduction -- Part 1. Regular continued fractions: Chapter 1. Classical notions and definitions -- Chapter 2. On integer geometry -- Chapter 3. Geometry of regular continued fractions -- Chapter 4. Complete invariant of integer angles -- Chapter 5. Integer trigonometry for integer angles -- Chapter 6. Integer angles of integer triangles -- Chapter 7. Continued fractions and $SL(2; \mathbb{Z})$ conjugacy classes. Elements of Gauss Reduction Theory. Markoff spectrum -- Chapter 8. Lagrange theorem -- Chapter 9. Gauss-Kuzmin statistics -- Chapter 10. Geometric approximation aspects -- Chapter 11. Geometry of continued fractions with real elements and the second Kepler law -- Chapter 12. Integer angles of polygons and global relations to toric singularities -- Part 2. Klein polyhedra: Chapter 13. Basic notions and definitions of multidimensional integer geometry -- Chapter 14. On

empty simplices, pyramids, parallelepipeds -- Chapter 15. Multidimensional continued fractions in the sense of Klein -- Chapter 16. Dirichlet groups and lattice reduction -- Chapter 17. Periodicity of Klein polyhedra. Generalization of Lagrange theorem -- Chapter 18. Multidimensional Gauss-Kuzmin statistics -- Chapter 19. On construction of multidimensional continued fractions -- Chapter 20. Gauss Reduction in higher dimensions -- Chapter 21. Decomposable forms. Relation to Littlewood and Oppenheim conjectures -- Chapter 22. Approximation of maximal commutative subgroups -- Chapter 23. Other generalizations of continued fractions -- Bibliography .

Sommario/riassunto

Traditionally a subject of number theory, continued fractions appear in dynamical systems, algebraic geometry, topology, and even celestial mechanics. The rise of computational geometry has resulted in renewed interest in multidimensional generalizations of continued fractions. Numerous classical theorems have been extended to the multidimensional case, casting light on phenomena in diverse areas of mathematics. This book introduces a new geometric vision of continued fractions. It covers several applications to questions related to such areas as Diophantine approximation, algebraic number theory, and toric geometry. The reader will find an overview of current progress in the geometric theory of multidimensional continued fractions accompanied by currently open problems. Whenever possible, we illustrate geometric constructions with figures and examples. Each chapter has exercises useful for undergraduate or graduate courses.
