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Nota di contenuto	Front matter -- Contents -- Preface -- Chapter 1. Introduction -- Part 1. The Erratic Orbits Theorem -- Chapter 2. The Arithmetic Graph -- Chapter 3. The Hexagrid Theorem -- Chapter 4. Period Copying -- Chapter 5. Proof of the Erratic Orbits Theorem -- Part 2. The Master Picture Theorem -- Chapter 6. The Master Picture Theorem -- Chapter 7. The Pinwheel Lemma -- Chapter 8. The Torus Lemma -- Chapter 9. The Strip Functions -- Chapter 10. Proof of the Master Picture Theorem -- Part 3. Arithmetic Graph Structure Theorems -- Chapter 11. Proof of the Embedding Theorem -- Chapter 12. Extension and Symmetry -- Chapter 13. Proof of Hexagrid Theorem I -- Chapter 14. The Barrier Theorem -- Chapter 15. Proof of Hexagrid Theorem II -- Chapter 16. Proof of the Intersection Lemma -- Part 4. Period-Copying Theorems -- Chapter 17. Diophantine Approximation -- Chapter 18. The Diophantine Lemma -- Chapter 19. The Decomposition Theorem -- Chapter 20. Existence of Strong Sequences -- Part 5. The Comet Theorem -- Chapter 21. Structure of the Inferior and Superior Sequences -- Chapter 22. The Fundamental Orbit -- Chapter 23. The Comet Theorem -- Chapter 24. Dynamical Consequences -- Chapter

25. Geometric Consequences -- Part 6. More Structure Theorems -- Chapter 26. Proof of the Copy Theorem -- Chapter 27. Pivot Arcs in the Even Case -- Chapter 28. Proof of the Pivot Theorem -- Chapter 29. Proof of the Period Theorem -- Chapter 30. Hovering Components -- Chapter 31. Proof of the Low Vertex Theorem -- Appendix -- Bibliography -- Index

Sommario/riassunto

Outer billiards is a basic dynamical system defined relative to a convex shape in the plane. B. H. Neumann introduced this system in the 1950's, and J. Moser popularized it as a toy model for celestial mechanics. All along, the so-called Moser-Neumann question has been one of the central problems in the field. This question asks whether or not one can have an outer billiards system with an unbounded orbit. The Moser-Neumann question is an idealized version of the question of whether, because of small disturbances in its orbit, the Earth can break out of its orbit and fly away from the Sun. In Outer Billiards on Kites, Richard Schwartz presents his affirmative solution to the Moser-Neumann problem. He shows that an outer billiards system can have an unbounded orbit when defined relative to any irrational kite. A kite is a quadrilateral having a diagonal that is a line of bilateral symmetry. The kite is irrational if the other diagonal divides the quadrilateral into two triangles whose areas are not rationally related. In addition to solving the basic problem, Schwartz relates outer billiards on kites to such topics as Diophantine approximation, the modular group, self-similar sets, polytope exchange maps, profinite completions of the integers, and solenoids--connections that together allow for a fairly complete analysis of the dynamical system.