

1. Record Nr.	UNINA9910795917503321
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Titolo	Aperiodic order . Volume 1 A mathematical invitation / / Michael Baake, Uwe Grimm [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2013
ISBN	1-316-18318-1 1-316-18367-X 1-316-18377-7 1-316-18448-X 1-316-18473-0 1-316-18403-X 1-139-02525-2
Descrizione fisica	1 online resource (xvi, 531 pages) : digital, PDF file(s)
Collana	Encyclopedia of mathematics and its applications ; ; volume 149
Disciplina	548.7
Soggetti	Aperiodic tilings Quasicrystals - Mathematics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Half-title; Series information; Title page; Copyright information; Table of contents; Foreword; Preface; Chapter 1 Introduction; Chapter 2 Preliminaries; 2.1. Point sets; 2.2. Voronoi and Delone cells; 2.3. Groups; 2.4. Perron-Frobenius theory; 2.5. Number-theoretic tools; Chapter 3 Lattices and Crystals; 3.1. Periodicity and lattices; 3.2. The crystallographic restriction; 3.3. Root lattices; 3.4. Minkowski embedding; Chapter 4 Symbolic Substitutions and Inflations; 4.1. Substitution rules; 4.2. Hulls and their properties; 4.3. Symmetries, invariant measures and ergodicity 4.4. Metallic means sequences 4.5. Period doubling and paper folding; 4.6. Thue-Morse substitution; 4.7. Rudin-Shapiro and Kolakoski sequences; 4.8. Complexity and further directions; 4.9. Block substitutions; Chapter 5 Patterns and Tilings; 5.1. Patterns and local indistinguishability; 5.2. Local derivability; 5.3. Repetitivity and finite local complexity; 5.4. Geometric hull; 5.5. Proximality; 5.6. Symmetry and inflation; 5.7. Local rules; Chapter 6 Inflation Tilings; 6.1.

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Sommario/riassunto

Quasicrystals are non-periodic solids that were discovered in 1982 by Dan Shechtman, Nobel Prize Laureate in Chemistry 2011. The underlying mathematics, known as the theory of aperiodic order, is the subject of this comprehensive multi-volume series. This first volume provides a graduate-level introduction to the many facets of this relatively new area of mathematics. Special attention is given to methods from algebra, discrete geometry and harmonic analysis, while the main focus is on topics motivated by physics and crystallography. In particular, the authors provide a systematic exposition of the mathematical theory of kinematic diffraction. Numerous illustrations and worked-out examples help the reader to bridge the gap between theory and application. The authors also point to more advanced topics to show how the theory interacts with other areas of pure and applied mathematics.