1. Record Nr. UNINA9910461795303321

Autore	Szczepanski Andrzej
Titolo	Geometry of crystallographic groups [[electronic resource] /] / Andrzej Szczepanski
Pubbl/distr/stampa	Hackensack, NJ, : World Scientific, 2012
ISBN	1-283-63598-4 981-4412-26-0
Descrizione fisica	1 online resource (208 p.)
Collana	Algebra and discrete mathematics ; ; v. 4
Disciplina	548/.81
Soggetti	Symmetry groups Crystallography, Mathematical Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Contents; Preface; 1. Definitions; 1.1 Exercises; 2. Bieberbach Theorems; 2.1 The first Bieberbach Theorem; 2.2 Proof of the second Bieberbach Theorem; 2.2.1 Cohomology group language; 2.3 Proof of the third Bieberbach Theorem; 2.4 Exercises; 3. Classification Methods; 3.1 Three methods of classification; 3.1.1 The methods of Calabi and Auslander-Vasquez; 3.2 Classification in dimension two; 3.3 Platycosms; 3.4 Exercises; 4. Flat Manifolds with b1 = 0; 4.1 Examples of (non)primitive groups; 4.2 Minimal dimension; 4.3 Exercises; 5. Outer Automorphism Groups 5.1 Some representation theory and 9-diagrams5.2 Infinity of outer automorphism group; 5.3 R1 - groups; 5.4 Exercises; 6. Spin Structures and Dirac Operator; 6.1 Spin(n) group; 6.2 Vector bundles; 6.3 Spin structure; 6.3.1 Case of cyclic holonomy; 6.4 The Dirac operator; 6.5 Exercises; 7. Flat Manifolds with Complex Structures; 7.1 Kahler flat manifolds in low dimensions; 7.2 The Hodge diamond for Kahler flat manifolds; 7.3 Exercises; 8. Crystallographic Groups as Isometries of Hn; 8.1 Hyperbolic space Hn; 8.2 Exercises; 9. Hantzsche-Wendt Groups; 9.1 Definitions; 9.2 Non-oriented GHW groups 9.3 Graph connecting GHW manifolds9.4 Abelianization of HW group; 9.5 Relation with Fibonacci groups; 9.6 An invariant of GHW; 9.7 Complex Hantzsche-Wendt manifolds; 9.8 Exercises; 10. Open

Problems; 10.1 The classification problems; 10.2 The Anosov relation for flat manifolds; 10.3 Generalized Hantzsche-Wendt flat manifolds; 10.4 Flat manifolds and other geometries; 10.5 The Auslander conjecture; Appendix A Alternative Proof of Bieberbach Theorem; Appendix B Burnside Transfer Theorem; Appendix C Example of a Flat Manifold without Symmetry; Bibliography; Index

Sommario/riassunto

Crystallographic groups are groups which act in a nice way and via isometries on some n-dimensional Euclidean space. They got their name, because in three dimensions they occur as the symmetry groups of a crystal (which we imagine to extend to infinity in all directions). The book is divided into two parts. In the first part, the basic theory of crystallographic groups is developed from the very beginning, while in the second part, more advanced and more recent topics are discussed. So the first part of the book should be usable as a textbook, while the second part is more interesting to resea