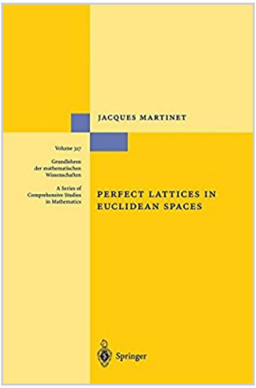

Perfect Lattices in Euclidean Space

By Jacques Martinet

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Lattices are discrete subgroups of maximal rank in a Euclidean space. To each such geometrical object, we can attach a canonical sphere packing which, assuming some regularity, has a density. The question of estimating the highest possible density of a sphere packing in a given dimension is a fascinating and difficult problem: the answer is known only up to dimension 3.

This book thus discusses a beautiful and central problem in mathematics, which involves geometry, number theory, coding theory and group theory, centering on the study of extreme lattices, i.e. those on which the density attains a local maximum, and on the so-called perfection property.

Written by a leader in the field, it is closely related to, though disjoint in content from, the classic book by J.H. Conway and N.J.A. Sloane, Sphere Packings, Lattices and Groups, published in the same series as vol. 290.

Every chapter except the first and the last contains numerous exercises. For simplicity those chapters involving heavy computational methods contain only few exercises. It includes appendices on Semi-Simple Algebras and Quaternions and Strongly Perfect Lattices.

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Perfect Lattices in Euclidean Space By Jacques Martinet Bibliography

- Sales Rank: #586220 in Books
- Published on: 2003-02-12
- Original language: English
- Number of items: 1
- Dimensions: 9.21" h x 1.25" w x 6.14" l, 2.09 pounds
- Binding: Hardcover
- 541 pages

Editorial Review

Review

From the reviews:

"It is worth saying at the outset that Perfect lattices in Euclidean spaces is a state-of-the-art research monograph (with exercises) by one of the leading experts in this rapidly developing field … . Martinet’s book appears in the same Springer series as Conway and Sloane’s epochal Sphere packings, lattices and groups and it will be similarly appreciated by researchers in this area as a carefully written, historically aware and authoritative companion volume focusing on local methods in lattice theory." (Nick Lord, The Mathematical Gazette, Vol. 88 (512), 2004)

Language Notes
Text: English (translation)
Original Language: French

From the Back Cover

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Users Review

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Nancy Sanchez:

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