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Autore	Morawiec Adam
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Soggetti	Crystallography Metals Materials science - Data processing Electrons - Diffraction Instrumental analysis X-ray spectroscopy Materials - Microscopy Crystallography and Scattering Methods Metals and Alloys Computational Materials Science Diffraction X-Ray Spectroscopy Microscopy
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Note generali	Includes index.
Nota di contenuto	Geometric crystallography -- Basic aspects of crystal diffraction -- Diffraction of high energy electrons -- Cartesian reference frames in diffractometry -- Indexing of single crystal diffraction patterns -- Ab-inito indexing of Laue patterns -- Indexing of powder diffraction patterns -- Indexing for orientation determination -- Indexing of spot-type diffraction patterns -- Complications in indexing -- Multigrain indexing -- Beyond diffraction by periodic crystals -- Quasicrystals --

Strain determination.

Sommario/riassunto

This book provides a detailed, self-contained description of automatic indexing of crystal diffraction patterns, considering both ab initio indexing and indexing of patterns originating from known structures. Introductory chapters equip the reader with the necessary basic knowledge of geometric crystallography, as well as kinematic and dynamic theories of crystal diffraction. Subsequent chapters delve and describe ab initio indexing of single crystal diffraction patterns and indexing of patterns for orientation determination. The book also reviews methods of indexing powder diffraction and electron spot-type patterns, as well the subject of multigrain indexing. Later chapters are devoted to diffraction by helical structures and quasicrystals, as well as some aspects of lattice parameter refinement and strain determination. The book is intended equally for materials scientists curious about ‘nuts and bolts’ of diffraction pattern indexing and orientation mapping systems, as well as interdisciplinary researchers from physics, chemistry, and biology involved in crystallographic computing. It provides a rigorous, yet accessible, treatment of the subject matter for graduate students interested in understanding the functioning of diffraction pattern indexing engines.