



The Basics of Crystallography and Diffraction: Fourth Edition (International Union of Crystallography Texts on Crystallography)

By Christopher Hammond

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This book provides a clear and very broadly based introduction to crystallography, light, X-ray and electron diffraction - a knowledge which is essential to students in a wide range of scientific disciplines but which is otherwise generally covered in subject-specific and more mathematically detailed texts. The text is also designed to appeal to the more general reader since it shows, by historical and biographical references, how the subject has developed from the work and insights of successive generations of crystallographers and scientists.

The book shows how an understanding of crystal structures, both inorganic and organic may be built up from simple ideas of atomic and molecular packing. Beginning with (two dimensional) examples of patterns and tilings, the concepts of lattices, symmetry point and space groups are developed. 'Penrose' tilings and quasiperiodic structures are also included. The reciprocal lattice and its importance in understanding the geometry of light, X-ray and electron diffraction patterns is explained in simple terms, leading to Fourier analysis in diffraction, crystal structure determination, image formation and the diffraction-limited resolution in these techniques. Practical X-ray and electron diffraction techniques and their applications are described. A recurring theme is the common principles: the techniques are not treated in isolation.

The fourth edition has been revised throughout, and includes new sections on Fourier analysis, Patterson maps, direct methods, charge flipping, group theory in crystallography, and a new chapter on the description of physical properties of crystals by tensors (Chapter 14).

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Editorial Review

Review

"This updated, clearly written edition of a highly successful book is nearly 100 pages longer than its predecessor... Overall, a complete and valuable resource for any practicing crystallographer or upper-level student in crystallography. Highly recommended." --*CHOICE*

"[A] very good introduction to crystallography." --*Crystallography Reviews*

"[T]his is a fine book for anyone wanting to learn about crystallography. It is an enjoyable and informative read, and is one of my favorite books to recommend to students and colleagues alike. It should have a place on the shelf of any physicist, chemist, materials scientist or biologist, who has to navigate this subject."

--*Mike Glazer, infocus*

About the Author

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Christopher Hammond was educated at The Gateway School, Leciester, The University of Cambridge (BA, 1964) and The University of Leeds (Ph.D, 1968). From 1968 to 2005 he was Lecturer, then Senior Lecturer, in the Department of Metallurgy (later the Insitute for Materials Research) and carried out research on titanium alloys. He is a Fellow of the Royal Microscopical Society and a Life Fellow of the University of Leeds. He has long experience of teaching with the University and RMS courses.

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