

**Fundamentals of crystallography**, 2nd edition. Edited by C. Giacovazzo. **IUCr Texts on Crystallography** 7. Oxford: IUCr/Oxford University Press, 2002. Pp. xxi + 825 + included CD. Price (hardback) GBP 75.00, ISBN 0-19-850957-X; (paperback) GBP 39.50, ISBN 0-19-850958-8.

The first edition of this book was published in 1992 and reviewed in this journal [*Acta Cryst.* (1993), **A49**, 373–374]. According to the editor, in this second edition, ‘Most of the material in the first edition has been preserved, important new topics have been added and the presentation of the old ones has been improved’. Your reviewer finds this to be so.

Major changes include a new chapter, *Beyond ideal crystals*, written by the editor, which gathers together material previously scattered throughout the earlier edition (and often somewhat incongruously placed) and adds to it new topics so as to systematize the treatment of scattering from real crystals and non-crystalline scatterers. It deals with crystal twins, diffuse scattering, modulated structures, quasicrystals, liquid crystals, the paracrystal, and diffraction from amorphous and liquid systems. The coverage is mathematically intensive and is supplemented by photographs of actual and simulated diffraction patterns for protein, RNA and quasicrystals. The original chapter on *Experimental methods in X-ray crystallography* has been expanded, with Gilberto Artioli joining Hugo L. Monaco as co-author, to include neutron scattering. Fernando Scordari’s chapter on *Ionic crystals* in the first edition has been replaced by a

## book reviews

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somewhat larger contribution, by Giovanni Ferraris, on *Mineral and inorganic crystals*. Guiseppi Zanotti’s chapter on *Protein crystallography* has been updated, rearranged and expanded to include an introductory section on structural characteristics of proteins, and has some fine color plates. Other improvements include systematized numbering of individual sections within the chapters, and a comprehensive updating of references.

The included CD features an interactive treatment of topics from the chapters on symmetry, computing and diffraction. The presentation divides the screen with text material on the right and interactive graphics panels on the left. Some of the features in the section on symmetry (plane lattices and centered lattices) were non-functional on my copy, but the easy visualization of symmetry operators and operations presented on the left compared favorably with the formal text descriptions on the right. Much of the section on computing has this same duality, though the addition on the left of a lightning fast calculator does little to illuminate the rigorous mathematical formulations on the right.

However, the CD really comes into its own in the sections dealing with Fourier transforms, the calculation of structure factors and the evaluation of electron density. Transforms for a wide range of patterns are quickly and attractively displayed. For structure factors, vector sums, calculated one atom at a time or all together, are displayed. A simple, but realistic, two-dimensional electron-density calculation may be carried out varying grid point spacing and resolution and showing, if

desired, the contributions of individual structure factors or combinations chosen from a weighted reciprocal lattice.

All in all, this new edition is a worthy successor to the original, with the same breadth and authority of presentation as its predecessor. One wishes that the paperback version could have been priced so as to make it quite irresistible to students. Those able to afford it, however, will find their money well spent.

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## books received

The following books have been received by the Editor. Brief and generally uncritical notices are given of works of marginal crystallographic interest; occasionally, a book of fundamental interest is included under this heading because of difficulty in finding a suitable reviewer without great delay.

**Structure determination from powder diffraction data**. Edited by W. I. F. David, K. Shankland, L. M. McCusker & Ch. Baerlocher. **IUCr Monographs on Crystallography** 13. Oxford: IUCr/Oxford University Press, 2002. Pp. xvii + 337. Price GBP 70.00. ISBN 0-19-850091-2.

A review of this book, by J. I. Langford, has been published in the February 2003 issue of *J. Appl. Cryst.*, pages 169–170.