Groups). 7. The 230 Space Groups. Part II: Symmetry in Crystallography. 8. Introduction to Space-Group Symmetry. 9. Crystal Lattices. 10. Point Groups and Crystal Classes. 11. Symmetry Operations. 12. Space-Group Symbols and Their Use. 13. Isomorphic Subgroups of Space Groups. 14. Lattice Complexes. Subject Index.

The volume costs 385 Netherlands Guilders. Personal copies may be obtained at the reduced price of 215 Netherlands Guilders.

The remaining stocks of Volumes II (Mathematical Tables) and IV (Revised and Supplementary Tables to Volumes II and III) of *International Tables for X-ray Crystallography* have been transferred from The Kynoch Press to Reidel, who are currently reprinting Volume III (Physical and Chemical Tables). Volume II costs 130 Guilders and Volumes III and IV 155 Guilders. Personal copies may be obtained at the reduced prices of 77 Guilders (Volume II) and 105 Guilders (Volumes III and IV).

Copies of all these publications may be ordered direct from the publisher, D. Reidel Publishing Company, PO Box 17, 3300 AA Dordrecht, The Netherlands, from Polycrystal Book Service, PO Box 27, Western Springs, Illinois 60558, USA, or from any bookseller.

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Crystallographic Statistics

The Twelfth International Congress of Crystallography, held in Ottawa in 1981, included for the first time a session entirely devoted to crystallographic statistics. Eight papers were presented at the session, and there were several papers on related topics presented in other sessions. Fifteen of the papers have now been published by the Indian Academy of Sciences at a very attractive price. In most cases the texts have been expanded by the authors from the versions presented at the Congress; three papers published in full elsewhere are represented by extended abstracts. The contributions (abbreviated titles) are: *Introduction* by A. J. C. Wilson; *Crystallographic Statistics – General Review* by H. Hauptman; *Bayesian Statistics – An Overview* by S. French and S. Oatley; *Intensity Statistics – Survey, Computer Simulation and the Heavy-Atom Problem* by U. Shmueli; *Non-Ideal Distributions in Theory and Practice* by U. Shmueli and A. J. C. Wilson; *The Probability of Validity of Phase Relations* by G. B. Mitra and S. Ghosh; *Effects of Heavy Atoms and Symmetry* by G. D. Nigam and S. Ghosh; *Measurability of Bijvoet Differences* by S. Parthasarathy; *Non-Independence* (Editorial comment); *Statistics of Recorded Counts* by J. L. de Boer; *Alternatives to R Tests* by S. M. Rothstein; *Residual R_2 as a Discriminator Criterion* by A. T. H. Lenstra; *Alternatives to Least Squares* (Editorial comment); *Robust/Resistant Technique for Refinement* by W. L. Nicholson, E. Prince, J. Buchanan and P. Tucker; *Statistical Errors and Series Termination in Electron Density* by A. A. Shevyrev and V. I. Simonov; *Data Reduction and Error Analysis* by R. H. Blessing and G. T. DeTitta; *Secondary 'Least-Squares' Minima* by R. Rothbauer; *Wiener Methods for Electron Density* by D. M. Collins and M. C. Mahar. The indexes occupy 13 pages.

Orders for *Crystallographic Statistics: Progress and Problems*, edited by S. Ramaseshan, M. F. Richardson and A. J. C. Wilson (Pp. iv + 313), should be sent to the Indian Academy of Sciences, Bangalore 560 080, India and be accompanied by a remittance. The prices (including postage – surface mail – anywhere in the world) are US $18.00; £9.00; R (Indian rupees) 50.00 (full rate) and US $9.00; £5.00; R (Indian rupees) 25.00 (reduced rate for individuals; copies purchased at reduced rate should not be passed to libraries).

Book Reviews

Works intended for notice in this column should be sent direct to the Book-Review Editor (J. H. Robertson, School of Chemistry, University of Leeds, Leeds LS2 9JT, England). As far as practicable books will be reviewed in a country different from that of publication.

Acta Cryst. (1983). A**39**, 270–271

Nonlinear phenomena at phase transitions and instabilities. Edited by R. RISTE. Pp. xii + 481. New York: Plenum, 1982. Price US $59.50.

This book is composed of a collection of manuscripts representing twenty-eight papers presented at a NATO Advanced Study Institute held in Geilo, Norway, 29 March–9 April 1981. It is very similar in format to an earlier work, also edited by Professor Riste, summarizing a similar NATO Institute, *Ordering in strongly fluctuating condensed matter systems*.

The concept of the non-linearity of systems for certain phase transformations was introduced over ten years ago. Efforts, both theoretical and experimental, expended over the ensuing decade to elucidate the nature of these non-linear phenomena form the subject matter of this book. More than one-third of the lectures at the Institute were designed to be of an extended, tutorial nature. The purpose of these invited papers was to develop the necessary background material and to introduce some of the problem areas to be covered in the shorter, more specific research papers. The ten invited papers dealt with the topics of theory and anharmonic properties of structural phase transitions, non-linear excitations, including thermal convection, turbulence, and other instabilities in both solid and hydrodynamical systems, two-dimensional melting, and the phenomena of crystal growth.

An example of the excellent interaction between the 'tutorial' and the 'research' sections of the book is provided by the 'soliton', a concept introduced several years ago as a

non-linear mathematical solution for phase transitions in a linear array. The soliton is introduced and discussed in three separate tutorial sections. These are followed by specific experimental evidence of this concept in terms of inelastic neutron scattering data from the planar ferromagnet $CsNiF_3$. This is then followed in the text by two separate papers on (1) theoretical considerations of the creation of non-thermal solitons in a one-dimensional magnetic sine–Gordon system by a time-dependent magnetic field and (2) a system in which solitons are considered as separating portions of different states of local stability. Thus the reader is brought quickly from the introduction of the soliton to the current status of its place in modern theory.

As with a text of this type, each section is written by a separate author and the normal variances in notation, style, and typescript (photo-offset printing is used) are encountered. Most of the papers however are quite lucid, self-contained, and remarkedly error free, again perhaps due to the efforts of the editor.

The book spans a broad range in this growing and exciting field, epitaxial phase transitions, crystal growth, two-dimensional melting, hydrodynamical and electrothermal instabilities, and phason light scattering are all dealt with in detail. Excellent subject and chemical indices will make this text useful not only for those interested in learning the current state-of-the-art in non-linear phenomena at phase transitions, but also for researchers seeking to learn the current status of a specific topic in the field quickly.

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Symmetrien von Ornamenten und Kristallen. By M. KLEMM. Pp. vii + 214. Berlin: Springer-Verlag, 1982. Price DM 36.00, US $16.00.

The title suggests that, apart from mathematicians, crystallographers will be interested in this book. But the flap text and introduction state clearly that the book is written for students of mathematics to give them an opportunity to apply and deepen some basic knowledge on linear algebra and group theory in an attractive topic.

And, indeed, the reader has to be familiar with the famous 'proposition–proof–theorem–proof' style widely used by mathematicians. But, if you are, then the book offers on its two hundred pages a concise treatment of many topics, such as

 - definitions of movements, lattices and space groups
 - group extensions
 - derivation of the two-dimensional symmetry groups
 - derivation of all finite point groups in space
 - applications of the 32 geometric crystal classes to the tensors of crystal physics
 - derivation of the three-dimensional arithmetic crystal classes
 - derivation of the 230 space-group types
 - ternary quadratic forms and cell reduction
 - irreducible representations of space groups (5 pp.).

Furthermore, the book presents some selected results of *n*-dimensional crystallography. Most of the results are completely derived *ab ovo*, and the definitions are in accordance with crystallographic tradition.

So if someone is looking for complete and correct definitions and a presentation of the *algebraic* aspects of space groups, he should read this book. It will not be very helpful in developing what we call an *Anschauung* in German. Crystallographers usually have a good *Anschauung* of their groups, and if some of them want to take a retrospective view on the algebraic formalisms connected with space groups they will read this book with advantage.

Klemm's text enables even its 'crystallographic' reader to continue his studies with the beautiful book of R. L. E. Schwarzenberger, *N-dimensional crystallography* [cf. *Acta Cryst.* (1981), A**37**, 271]. This book appeared in 1980, and some of its really new results on our old groups are presented by Klemm, but it is missing in his list of literature.

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Point group symmetry applications: methods and tables. By P. H. BUTLER. Pp. ix + 551. New York: Plenum Press, 1981. Price US $55.00.

Although the title of this book, and its size, may suggest a comprehensive review of structure and properties of point groups, it treats a more restricted, though very important, subject. The main theme is the role of coupling coefficients, matrices that express a basis of a tensor representation of a group or of a representation subduced from a bigger group in bases of irreducible components. *Via* the Wigner–Eckart theorem these coupling coefficients (sometimes called Clebsch–Gordan coefficients) are very important for calculations of matrix elements of operators with a certain symmetry and are very useful in atomic, molecular and nuclear physics.

The major part of this work consists of tables of coupling coefficients for many of the subgroups of the orthogonal group $O(3)$. These tables are preceded by a clear introduction to the applications of Clebsch–Gordan coefficients and related coupling coefficients (like $3j$, $6j$ and $9j$ symbols) in general and to the use of the tables in particular. Topics are: the jm factors and j symbols, the Wigner–Eckart theorem, fractional parentage coefficients. Apart from tables for jm factors, $3j$, $6j$ and $9j$ symbols there are others with information on structure and characters of the point groups and with symmetry-adapted functions (up to $l = 8$).

In conclusion, the book can be recommended for those who want to do calculations in quantum systems with point-group symmetry, but will not be of much interest to most crystallographers.

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