

binary crystals in terms of a Kossel lattice model of the solid-liquid interface. Equilibrium and non-equilibrium properties are presented in various statistical approximation methods, such as the single particle, the pair, and the Bragg-Williams approximation, where the pair approximation was found to agree with a Monte-Carlo computer simulation.

The fourth chapter, *Statistics of surfaces, steps, and two-dimensional nuclei; a macroscopic approach* on the phenomenological approach is an attempt by A. A. Voronkov (37 pages) to provide a macroscopic concept as opposed to a microscopic one for defining crystal growth; the properties of singular as well as vicinal planes are given in terms of their specific surface free energy and a kinetic coefficient. This is an extensive and most important contribution to crystal-growth theory.

The fifth chapter, on *Surface and volume diffusion controlling step movement* by J. van der Eerden (32 pages) essentially treats material transport by volume and surface diffusion (as well as convection) and its effect on surface structure. Consecutive deposition of elementary structural particles into kink sites, onto steps and flat surfaces, in effect, represents crystal growth. The latter is normally preceded by surface diffusion of those particles towards steps and kinks (*i.e.* 'growth sinks') and, in turn, by volume diffusion from the adjacent mother phase towards the adsorbed surface layer of the crystal: a realistic model susceptible to meaningful mathematical and good physical interpretation.

A few general comments must now be made: P. Bak's statement that solids cannot be superheated is fundamental. Nevertheless, superheatings *have* been observed – although they are special cases, which in the reviewer's opinion may not, in fact, represent violations of the intended meaning of the author's statement. The latter would then only need to be refined or rephrased to accommodate this particular perspective.

There are a few typographical and related errors in the text, which fortunately do not critically change its meaning.

In summary, the five authors have presented up-to-date reviews on the theoretical interpretation of thermodynamical, statistical and kinetical aspects of solid-liquid interfacial structure, epitaxy, crystal growth, surface and volume diffusion on both a micro- and a macroscale.

As a comprehensive exposition of crystal-growth theory, this book should definitely be valued as a reference for the crystal grower who needs to know the reasons and explanations for what truly caused his latest crystal growth runs to go awry or, better, to succeed so well.

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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.

Electron distributions and the chemical bond. Edited by P. COPPENS and M. B. HALL, Pp. ix+479. New York and London: Plenum, 1982. Price US\$ 55.00. A review of this book, by D. W. J. Cruickshank, has been published in the October 1984 issue of *Acta Crystallographica*, Section B, page 520.

Indirect imaging. Edited by J. A. ROBERTS. Pp. xxii+442. Cambridge University Press, 1984. Price £27.50, US \$54.50.

Shock waves in condensed matter. Edited by J. R. ASAY, R. A. GRAHAM and G. K. STRAUB. Pp. xxvi+647. Amsterdam: North-Holland, 1984. Price US \$71.25, Dfl 185.00.

Surfaces and interfaces: physics and electronics. Edited by R. S. BAUER. Pp. xv+644. Amsterdam: North-Holland, 1983. Price US \$113.50, Dfl 295.00.

Electronic and atomic collisions: invited papers. Edited by J. EICHLER, I. V. HERTEL and N. STOLTERFOHT. Pp. xviii+891. Amsterdam: North-Holland, 1984. Price Dfl 315.00, US \$121.25. This book (which stems from the Berlin conference of August 1983) begins with a separately-paginated 50-page article by Jost Lemmerich, very readable, and richly illustrated, on the history of physics in (or associated with) Berlin, from its beginnings up to 1938.

The physics of hydrogenated amorphous silicon II. Electronic and vibrational properties. Edited by J. D. JOANNOPOULOS and G. LUCOVSKY. Pp. xiii+360. Berlin: Springer-Verlag. Price DM 100.00, US \$39.00.

Two-dimensional systems, heterostructures, and superlattices. Edited by G. BAUER, F. KUCHAR and H. HEINRICH. Pp. ix+293. Berlin: Springer-Verlag, 1984. Price DM 78.00, US \$28.00.

X-ray optics and microanalysis: 10th International Congress proceedings. (In French; Supplement to *Journal de Physique*.) Pp. xxxvi+925. Les Ulis, France: Editions de Physique, 1984. Price F 500.00.

Multicritical phenomena. Edited by R. PYNNE and A. SKJELTORP. Pp. xii+472. New York: Plenum, 1984. Price US \$75.00.

Electron-hole droplets in semiconductors. Edited by C. D. JEFFRIES and L. V. KELDYSH. Pp. xxxvii+656. Amsterdam: North-Holland, 1983. Price US \$180.75, Dfl 425.00.