

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.

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Physics of modern materials. Vols. 1 and 2. Edited by M. LEWIS. Pp. Vol. 1, vi + 530; Vol. 2, vi + 690. Published by the International Atomic Energy Agency, Vienna, 1980. Price: Vol. 1, Sch. 760; Vol. 2, Sch. 980.

This book consists of a collection of papers compiled from the lectures presented at an international course at Trieste 29 March–24 June 1978, organized by the International Centre for Theoretical Physics, an establishment of the International Atomic Energy Agency (IAEA) together with papers representing lectures presented at a Symposium on Classical Fluids which was held as part of the spring college on 12 and 13 June 1978. The material has been edited by the editorial staff of the IAEA and is published in two volumes.

The papers pertaining to the spring college on Physics of Modern Materials have been grouped subjectwise into six parts. Papers belonging to the first three parts, *viz* (1) Characterization and growth, (2) Defects and (3) Mechanical properties comprise the contents of Volume 1 while papers belonging to the next three parts, *viz* (4) Metals and alloys, (5) Semiconductors and devices, and (6) Amorphous materials and superionics, together with papers pertaining to the symposium on classical fluids, comprise the contents of Volume 2.

On the whole it represents a well organized review of the recent advances in the state of the art and the insights provided by theoretical developments in the study of the physics of modern materials along its various nascent and promising facets. The book (both volumes) is well presented. The sketches, diagrams, and graphical illustrations are well set out, thoroughly marked and explained; the photographs are well reproduced; and most of the papers give extensive references to recent articles on the topics dealt with. Typographical errors are very few, to the credit of the editorial staff.

Most of the articles are well written with a lucid style and research workers, teachers, and technical persons interested in the field will undoubtedly benefit in having access to the book. Most of the articles give extensive bibliography for use by enthusiastic workers in the related fields. But what many will miss is a subject index for ready reference and the absence of one will much minimize the work's role as a reference book. The books by their very nature will not be suitable as text books but will certainly be used extensively by research workers and teachers interested in the different fields of materials science.

Now coming to a discussion of the different parts we find that part 5 (semiconductors) is perhaps the best organized, containing a collection of five excellent articles together with a classified bibliography for energy bands in semiconductors. Particular mention should be made of the article

on *Semiconducting devices* by A. Frova, which is very well illustrated and of the highly interesting extensive article on *Optoelectronic materials and devices* by A. T. Schmidt, in which the author develops the theory from the fundamentals, and leads us to *Nonlinear optics, lasers, optical switching and guided wave devices*.

Many research workers in experimental and theoretical fields, teachers and also graduate students will find interesting the excellent and extensive article by C. Paorici in part 1 in which the author has dealt at length with the various aspects of crystal growth and doping (both experimental and theoretical). The article is well illustrated.

The masterly article on *Defects* by J. Friedel in part 2 containing an illuminating introduction will be very helpful to its readers in developing physical concepts and insight. The article is quite extensive and includes discussion of friction and of liquid crystals, and is well illustrated.

Mention must also be made of the article by B. T. Matthias & P. R. Stein on *Superconducting materials* in part 4. The article, though descriptive and empirical, is highly penetrating and lucid as coming from a master mind.

But part 3 comprising papers dealing with mechanical properties, a most vital and interesting field, appeared to this reviewer to have been rather ill organized. The first paper by D. McLean on *Fracture mechanics* (a highly important, rapidly developing topic) has a very unsatisfactory bibliography which cites no research paper and only a few books, mostly published before 1974. The other two papers are highly abstruse mathematical articles.

Some will find themselves interested in the article by W. E. Spear in part 6 in which the author deals with the properties and promises of amorphous Si. The papers presented at the Symposium on Fluids are mainly highly mathematical.

P. K. CHATTERJEE

*Physics Department
Bengal Engineering College
Sibpur
Howrah-3
India*

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Surface crystallography by LEED: theory, computation and structural results. By M. R. VAN HOVE and S. Y. TONG. Pp. ix + 286. **Springer Verlag series in chemical physics**, edited by R. GOMER. Berlin: Springer Verlag, 1979. Price DM 59.00, US \$32.50.

In the preface, the authors point out that their aim is to publish a set of programs for use in the analysis of LEED data and for the description of surfaces. They also state that