

theory in crystal physics and on the principles and methods of band theory there are then chapters devoted to the electronic properties of both narrow and wide energy gap semiconductors. The reviews of excitations and of magneto-optics are particularly outstanding. Lattice properties are dealt with in the remaining chapters in which effects governed by phonons in perfect crystals, point defects, and their vibrational and electronic spectra and electron phonon interactions are stressed. Many of the authors have written more extensive reviews elsewhere and frequently the articles here are clearly intended to be read in conjunction with them. Most of the contributions are written at a level that most graduate students in physics will understand. There is probably more material included than could be dealt with satisfactorily in a two semester course on solid state spectroscopy, for which it is likely to prove better as a reference book than as a text. Although primarily intended for physicists there will be much in it of interest to solid state physical and inorganic chemists.

"Fun and hard work, both in considerable measure, have gone into the preparation of this volume." Equal effort on the part of the reader will no doubt produce a deep understanding of the fundamentals of the optical properties of solids.

It is appropriate that this volume should be dedicated to the late Professor F. Motossi, who acted as host for the institute. It forms a fitting memorial to one of the pioneers who laid the foundations of solid state spectroscopy.

G. R. WILKINSON

## PULSE METHODS

### Ultrasonic Methods in Solid State Physics

By Rohn Truett, Charles Elbaum and Bruce B. Chick. Pp. xiv + 464. (Academic Press: New York and London, April 1969.) 184s.

THE use of ultrasonic methods in the study of fundamental properties of solid materials has developed rapidly in the past fifteen or twenty years. It is possible with these methods to study any property of a solid which is sufficiently well coupled to the lattice to influence the propagation behaviour of an ultrasonic stress wave. The authors of this book have been closely associated with the development of this field of solid state physics and the recent untimely death of one of them, Rohn Truett, is a great loss.

The book is chiefly concerned with the type of investigation that can be carried out in the range of frequencies from a few megahertz to many kilomegahertz; it deals almost entirely with short-duration pulse methods rather than with standing-wave methods. The first part of the book is devoted to a classical treatment of wave propagation in solids, including piezoelectric crystals. The discussion includes an introduction to stress-wave propagation in non-linearly elastic media, when the detailed physical mechanism causing the non-linearity is not specified.

The second part of the book deals with the different pulse methods which are used in the measurement of attenuation and velocity. Details are given of the electronic systems which these methods require, which will be appreciated by anybody commencing experimental work in this field. Particular attention is also given to those effects which may give rise to an apparent attenuation, such as diffraction losses, bond or coupling losses and "non-parallelism" losses. A description of the way in which a spectrum analyser may be used in evaluating some of these effects is especially interesting.

The remainder of the book reviews the interactions between stress waves and various physical properties of a solid and contains some selected experimental results. The section on dislocation damping is more detailed

than that on any other loss mechanism and includes a discussion of the generation of harmonics by dislocations. An analysis is given for second harmonic generation only, however, and not for third harmonic generation. A good detailed account is given of the ultrasonic stress wave interactions with thermal lattice waves. Although the later work of Brugger, Mason and others in the high temperature region (particularly with regard to Grüneisen numbers) is not included, the inclusion of Maris's quantum mechanical treatment of attenuation will prove very useful to future researchers. In all, ten different loss interactions are discussed.

The presentation of this book is helped by the inclusion in various appendices of details which are of a very specialized character. The use of c/s throughout the book, however, is rather unfortunate in view of the present almost universal acceptance of Hz. This book should prove invaluable to anyone beginning work in the ultrasonic field as well as being useful to those already involved in such work.

C. R. SCOREY

## University News

**Dr J. O. Newton**, University of Manchester, has been appointed professor and head of the department of nuclear physics in the Research School of Physical Sciences of the **Australian National University**.

**Dr G. R. Prout**, Medical College of Virginia, has been appointed professor of surgery at **Harvard University** and chief of the Urology Service at Massachusetts General Hospital.

**Dr I. M. Ward**, University of Bristol, has been appointed professor of physics at the **University of Leeds**.

**Professor R. H. Gorrill** has been appointed to the chair of microbiology tenable at **Guy's Hospital Medical School**, University of London.

**Mr P. J. H. King**, University College of Wales, has been appointed to the chair of computer science tenable at **Birkbeck College**, University of London.

**Dr I. M. Lewis**, University College, has been appointed to the chair of anthropology tenable at the **London School of Economics and Political Science**.

The title of professor of bacteriology has been conferred on **Dr G. R. F. Hilson** in respect of his post at **St George's Hospital Medical School**, University of London.

The title of professor of chemical engineering has been conferred on **Dr J. W. Mullin** in respect of his post at **University College**, University of London.

**Dr P. Curzen**, Charing Cross Hospital Medical School, has been appointed to the chair of obstetrics and gynaecology at **Westminster Medical School**, University of London.

The title of professor of medicine has been conferred on **Dr S. J. G. Semple** in respect of his post at **St Thomas's Hospital Medical School**, University of London.

**Dr C. E. Sunderlin**, special assistant to the president of the National Academy of Sciences, has been appointed vice-president and secretary of the **Rockefeller University**.

**Dr I. C. Cheeseman**, National Gas Turbine Establishment, has been appointed Westland professor of helicopter engineering at the **University of Southampton**.

**Professor C. White** has been appointed to the Ira Vaughan Hiscock professorship of public health at the School of Medicine, **Yale University**.