Light scattering

Dynamic Light Scattering. By Bruce J. Berne and Robert Pecora. (Wiley: New York, March 1976.) £14.00; $27.70.

CLOSELY following the introduction of the laser we have in recent years witnessed a considerable increase in the number of original publications and review articles on light scattering theory and its applications to chemistry, biology and physics. The novel feature which transformed classical light scattering into a modern field of study was the possibility of undertaking dynamic studies over an extensive range of time and frequency scales. Not all expectations have been fulfiled; the study of chemically reacting systems for instance has been rather disappointing so far and the successful extraction of higher order information, beyond the derivation of translational diffusion constants in dilute macromolecular solutions, has been the rare exception rather than the commonplace event.

From the book under review, as well as from its recent predecessor (see *Nature*, **255**, 90, 1975) we learn that sufficient time has not yet elapsed to place the whole field into proper perspective. This reviewer would have been grateful for a logical development of modern scattering theory comprising the phenomenological, electromagnetic and molecular aspects. The authors are eminently qualified for this undertaking. They present a welcome wealth of theoretical derivations, sometimes on a very elementary and at other times on a rather advanced specialised level. Interspersion of a large number of applications from many different fields detracts from the general purpose. Whereas the theory could easily have been presented as a permanent whole, the applications are fragmentary and ephemeral, and can only be fully appreciated by reference to the original works. The thread is broken and the consistency lost.

There are a number of details which I believe can be easily corrected in a future reprint. Some terms and names are misspelt, some references in the text are incomplete, and some references are given as 1974 and 1975 as being in press—in a book published in 1976. A glossary of symbols would have been helpful in view of the complicated nomenclature. To find out which diffusion coefficient is determined in the light scattering experiment the reader must struggle through the whole development of non-equilibrium thermodynamics taken from another source.

In spite of the above reservations, this book will be useful as a sourcebook of important theoretical information in specialised research laboratories active in a wide range of scattering studies.

Henryk Eisenberg

Henryk Eisenberg is a member of the Polymer Department, The Weizmann Institute of Science, Rehovet, Israel.

Pion–pion interaction

Pion-Pion Interactions in Particle Physics. By B. R. Martin, D. Morgan and G. Shaw. Pp. xi+460. (Academic: London and New York, May 1976.) £16; $40.50.

AT some time during their career, most high energy physicists must obtain some acquaintance with the pion-pion interaction, because of its pervasive nature in hadronic physics. In future, I will have no hesitation in recommending the appropriate chapter of this book to them as an essential reference. The book provides a timely review of the subject, as there have been many important developments, both experimental and theoretical, since the appearance of Petersen's comprehensive *Physics Reports* article in 1971.

The lack of real pion targets means that special techniques have been developed to extract data on $\pi\pi$ scattering. A substantial part of this book is devoted to a careful explanation of these methods and the results from recent high precision experiments. The other major section of the book deals with theories and models of $\pi\pi$ scattering.

In places the book inevitably reflects the authors' own approach to the field. It is, for example, somewhat surprising that explicit expressions for the S and P wave contributions to the important Roy equations are not included in the otherwise extensive appendices. In general, however, they are to be congratulated on the care they have taken in preparing this book, which is destined to become a standard reference and should be available in all high energy physics libraries.

C. D. Froggatt

Dr C. D. Froggatt is a Lecturer in the Department of Natural Philosophy, Glasgow University and has made many contributions to the phenomenology of pion–pion scattering.