Group theory and its application in physics

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T. Inui, Y. Tanabe, and Y. Onodera. *Group Theory and Its Applications in Physics*. (Springer Series in Solid-State Sciences, Vol. 78.) Springer-Verlag, Berlin; Heidelberg; New York, 1990. 397 p.

The book is a translation from Japanese of a fairly standard aid on group theory and its applications in atomic, molecular, and solid state physics. The book is intended both for students and researchers who are becoming acquainted with group theory for the first time, and also for specialists who want to study specific applications of group theory in physics in more detail. The book itself is also suitably organized. The first six chapters are devoted to general questions concerning the theory of groups, and their representations and application in quantum mechanics. More special questions concerning the theory of group rotation, groups of points, and permutations of groups are then considered in the next nine chapters. Individual chapters are devoted to consideration of the electron states of molecules and of molecular vibrations. In addition to the standard material concerning space groups and their use for describing the electron states in crystals, there is an individual chapter on the application of group theory in the theory of Landau phase transitions. One must consider the detailed nature of all derivations and the large number of illustrations, which make the study of the material considerably easier, to be the merits of this book.