

1. Record Nr.	UNINA9910480154503321
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Titolo	Group Theory and Its Applications in Physics [[electronic resource] /] / by Teturo Inui, Yukito Tanabe, Yositaka Onodera
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 1990
ISBN	3-642-80021-1
Edizione	[1st ed. 1990.]
Descrizione fisica	1 online resource (XV, 397 p.)
Collana	Springer Series in Solid-State Sciences, , 0171-1873 ; ; 78
Disciplina	530.1/522
Soggetti	Physics Crystallography Atoms Mathematical Methods in Physics Numerical and Computational Physics, Simulation Crystallography and Scattering Methods Atomic, Molecular, Optical and Plasma Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"With 72 Figures."
Nota di bibliografia	Includes bibliographical references and index.
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Sommario/riassunto

This book has been written to introduce readers to group theory and its applications in atomic physics, molecular physics, and solid-state physics. The first Japanese edition was published in 1976. The present English edition has been translated by the authors from the revised and enlarged edition of 1980. In translation, slight modifications have been made in Chaps. 8 and 14 to update and condense the contents, together with some minor additions and improvements throughout the volume. The authors cordially thank Professor J. L. Birman and Professor M. Cardona, who encouraged them to prepare the English translation. Tokyo, January 1990 T. Inui . Y. Tanabe Y. Onodera Preface to the Japanese Edition As the title shows, this book has been prepared as a textbook to introduce readers to the applications of group theory in several fields of physics. Group theory is, in a nutshell, the mathematics of symmetry. It has three main areas of application in modern physics. The first originates from early studies of crystal morphology and constitutes a framework for classical crystal physics. The analysis of the symmetry of tensors representing macroscopic physical properties (such as elastic constants) belongs to this category. The second area was enunciated by E. Wigner (1926) as a powerful means of handling quantum-mechanical problems and was first applied in this sense to the analysis of atomic spectra. Soon, H.

