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Laser Spectroscopy of Solids II

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With 144 Figures

Springer-Verlag Berlin Heidelberg GmbH

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ISBN 978-3-662-30929-2 ISBN 978-3-540-45939-2 (eBook)
DOI 10.1007/978-3-540-45939-2

Library of Congress Cataloging-in-Publication Data. – Laser spectroscopy of solids II. (Topics in applied physics; v. 65) Includes index. 1. Solids-Spectra. 2. Semiconductors-Spectra. 3. Laser spectroscopy. I. Yen, W. M. (William M.) II. Dlott, Dana Donald. III. Series. QC176.8.06L375 1989 530.4'1 88-24859

Originally published by Springer-Verlag Berlin Heidelberg New York in 1989.
Softcover reprint of the hardcover 1st edition 1989

2154/3150-543210 – Printed on acid-free paper

Preface

As we noted in the second edition of the first volume of *Laser Spectroscopy of Solids* (Topics in Applied Physics, Vol. 49), we were delighted by and grateful for the reception it received from the various spectroscopy communities. We believe that the acceptance of a review volume by a critical scientific audience is simply evidence that it fulfils a current need. This was fortunately the case with the first volume. It is, of course, the hope of the contributors to this sequel volume that it also appears at an appropriate time. All indications appear to be in our favor as the activity in laser spectroscopy applied to condensed phases continues to grow in an impressive fashion and to mature into an almost routine tool in the study of solid-state optical properties.

The first volume dealt principally with optically active ordered and disordered insulating systems; this was because many of the laser spectroscopic techniques transplanted from atomic studies were first applied in this type of solid. Inevitably, as tunable lasers of various types have become readily accessible, laser spectroscopic applications have expanded to include other types of condensed systems. For example, the advent of commercial picosecond laser systems has made it possible to study the dynamics occurring in semiconductors and in semiconductor structures, studies which would not have been possible a decade ago.

In this volume, we continue to contend that conceptually all optically active materials will, with an appropriate change in some gauge, behave in analogous ways and that differences which arise are to a large extent semantic. Thus, in the following contributions, we have endeavored to minimize specialized terminology and to emphasize the common thread and methodology that bind these studies. The chapters are sufficiently tutorial that they can serve as an introduction to those wishing to learn about the subject matter. However, they also possess the depth to serve as current reviews of the understanding that the use of laser spectroscopy has brought to the phenomena which affect optically excited states in condensed phases.

The authors of each chapter have played important roles in the advances which they review. Each of them therefore has the essential perspective necessary to survey the general advances in their respective fields in a fair and comprehensive manner. This is apparent in their contributions. I am personally most thankful to them for the effort and care they took in preparing their individual chapters, all of which I believe will withstand the test of time.

Finally, I wish to acknowledge the continued support and encouragement of Dr. H. K. V. Lotsch and the editorial staff at Springer-Verlag. Their patient guidance has considerably eased my task as the organizer of this effort. Support has also been provided by the National Science Foundation, the Department of Energy, and the University of Georgia.

Athens, GA, December 1988 *William M. Yen*

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