

# Light Scattering in Solids v

Superlattices and Other Microstructures

Edited by M. Cardona and G. Güntherodt

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With 184 Figures

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## Preface

This volume is the fifth of a series [Topics in Applied Physics (TAP), Vols. 8, 50, 51, 54, 66] devoted to the scattering of light by solids. The first and second volumes (TAP 8 and 50) emphasize general concepts and theoretical background, the third (TAP 51), investigations of specific materials and also Brillouin scattering, and TAP 54 discusses light scattering by electronic excitations, surface enhanced Raman scattering and effects of pressure on phonon spectra. A detailed list of contents of these volumes can be found in the second edition (paperback) of TAP 8.

The present volume is devoted to light scattering by interfaces and artificial microstructures (such as the so-called superlattices). The growth and characterization of such structures has now reached a high degree of sophistication including developments which culminated in the discovery of the ordinary and fractional quantum Hall effects and related theoretical work. Light scattering spectroscopy is an ideal technique for the investigation and characterization of such structures, since the incident laser light can be focused to dimensions of the order of those of the microstructures. This volume contains theoretical background on the excitations accessible to light scattering (Chap. 2), and a review of scattering by phonons (Chap. 3) and by electronic excitations (Chap. 4). Chapter 5 discusses artificial quasiperiodic (Fibonacci) and aperiodic (Thue-Morse) superlattices. Chapter 6 presents the state of the art of multichannel detectors, which can be used to great advantage for recording very weak scattering signals such as those obtained at a single interface. Chapter 7 treats metallic superlattices and Chap. 8 scattering by magnetic excitations.

The editors would like to thank all authors, especially those who were diligent enough to comply with the original, seldom adhered to, deadline.

This volume is dedicated to the various groups who contributed to the preparation of the samples discussed in its chapters. Without their high degree of expertise, sophistication and dedication, the advances described here would not have been possible. Last but not least thanks are due to S. Birtel and I. Dahl for expert secretarial help and skillful typing.

Stuttgart and Aachen,  
November 1988

*Manuel Cardona*  
*Gernot Güntherodt*

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