

# Preface

Readers of this book are aware that the theory of the Raman effect has been known for over 80 years, though routine Raman spectroscopy experiments were performed only after almost another half century of technological development. Since then, the analytical potential of this specific light-scattering effect has been explored for decades and resulted in a wealth of scientific publications. It took another major step in technical development toward the end of the second millennium that allowed the three-dimensional chemometric characterization of materials with high sensitivity and diffraction-limited resolution by combining confocal microscopy and Raman spectroscopy. With the inception of the resulting high-resolution confocal Raman microscopy as a novel analytical technique, new realms for the application of this method were defined and new research goals formulated. This has resulted in an expanding pool of experience and expertise.

The motivation to compile this book largely emerged from the observation that among the substantial portfolio of excellent publications of monographs on Raman spectroscopy, there are few dedicated to confocal Raman microscopy or even high-resolution confocal Raman imaging. Encouraged additionally by conversation and discussion with experts in the field of confocal Raman microscopy, we realized the demand for a reference work that condenses background information on physical, technical, hardware, and software aspects that serve as prerequisites for high-end analytical microscopy equipment. Equally important are comprehensive data evaluation methods to further and foster data processing, permitting advancement of research by simply providing tools to obtain novel results and make new discoveries.

The goal of this book therefore is to provide the best possible overview of the theoretical and practical facts and issues associated with confocal Raman microscopy. With the incorporation of over a dozen contributions from expert scientists and research groups spanning a wide range of applications in academic research as well as industry-driven research and development, this first edition of “confocal Raman microscopy” provides a comprehensive frame of reference for anyone involved in research employing confocal Raman microscopy. Aiming to keep pace with technological advancement, it is our intention to keep this book as up-to-date as possible

in order to provide our readership with the current state of the art in confocal Raman microscopy. We therefore welcome any constructive comments or suggestions for all future editions.

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