

Surface-Enhanced Raman Spectroscopy and similar techniques like surface-enhanced fluorescence are emerging as powerful tools for analytical studies in many areas. They represent key examples of the potential applications of the rapidly developing field of plasmonics. This book provides an overview of the underlying fundamental principles of SERS and related plasmonic effects, from a basic understanding to their potential applications. The emphasis is placed on concepts and background material, such as Raman spectroscopy and fluorescence, the optical properties of metallic nanoparticles, or colloid science.

Besides an overview of current promising research topics, this book is a self-contained introduction to Raman spectroscopy and fluorescence that summarises the main concepts and ideas needed for SERS. It is also a self-contained introduction to the physics of plasmon resonances within the broader scope of plasmonics. A detailed presentation of the SERS electromagnetic model and its extension to surface-enhanced fluorescence is included.

Aimed primarily at newcomers to the field, graduate students, and other researchers or scientists attracted by the many possible applications of SERS and plasmonics, or their basic science, the book includes:

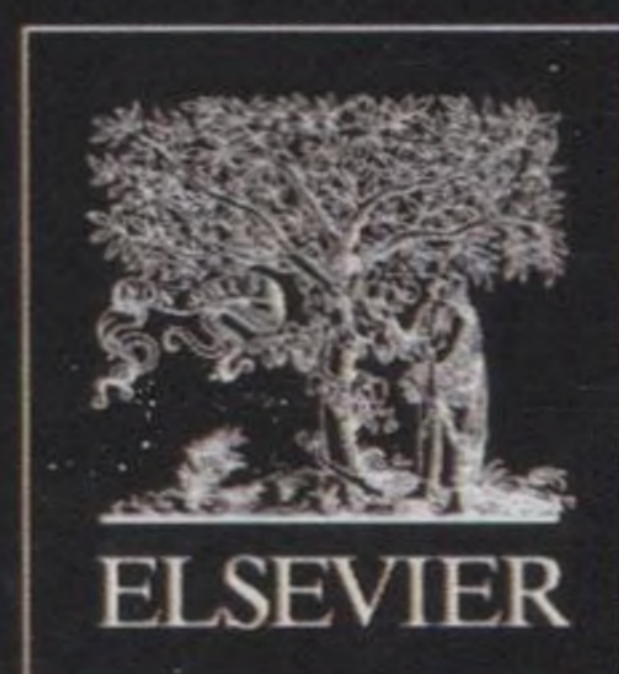
- Hands-on examples of SERS enhancement factor calculations for simple geometries
- A collection of self-contained appendices addressing specific topics of interest, such as DFT calculations for Raman applications or Mie Theory
- Links to ready-to-use Matlab codes for EM calculations, which can be used to implement the theoretical concepts and to reproduce many of the figures

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Book's web-page: www.victoria.ac.nz/raman/book

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