1. Record Nr. UNINA9910845093803321

Autore	Sun Mengtao
Titolo	Linear and Nonlinear Optical Spectroscopy and Microscopy [[electronic resource] /] / by Mengtao Sun, Xijiao Mu, Rui Li
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	981-9936-37-3
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (125 pages)
Collana	Progress in Optical Science and Photonics, , 2363-510X ; ; 29
Altri autori (Persone)	MuXijiao LiRui
Disciplina	543.5
Soggetti	Nonlinear Optics Optical spectroscopy Materials - Analysis Microscopy Quantum optics Signal processing Optical Spectroscopy Characterization and Analytical Technique Optical Microscopy Quantum Optics Signal, Speech and Image Processing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Chapter 1 Introduction -- Chapter 2 Basic theory of nonlinear optics -- Chapter 3 Basic theory and experiment technology of CARS -- Chapter 4 CARS spectroscopy and imaging application -- Chapter 5 Basic theory and experiment technology of SRS -- Chapter 6 SRS spectroscopy and imaging application -- Chapter 7 Theory and experiment technology of TPA, TPEF and TPIF -- Chapter 8 TPA, TPEF and TPIF spectroscopy and imaging application -- Chapter 9 Theory and experiment technology of SHG -- Chapter 10 Applications of SHG imaging microscopy.
Sommario/riassunto	The nonlinear optical spectrum signal technology is a new type of optical characterization technology owing to its non-invasiveness and good biocompatibility. This book highlights a comprehensive

introduction to the Stimulated Raman scattering (SRS), Anti-Stokes Raman Spectroscopy (CARS), Two-photon Excited Fluorescence (TPEF) and Second Harmonic Generation signals (SHG) technologies. The four types of nonlinear optical signals technologies, especially two-dimensional and three-dimensional imaging, have great application potential in physics, materials science, chemistry and biomedicine. The book covers principles, theoretical calculation methods, signal measurement methods and imaging specific methods. The theoretical part starts from the basics of nonlinear optics and the relationship with strong light, and gradually transitions to theoretical calculation methods for specific optical signals. it combines the classical theory and the quantum theory to help readers develop a thorough understanding of the technologies. The book is a good reference for graduate students majored in physics and chemistry and for researchers working on optics, photonics and materials science. .