Special Issue

Multimodal Vibrational Spectroscopy and Laser Applications in Molecular and Material Research

Message from the Guest Editors

This Special Issue aims to bring together recent advances in laser-based techniques and vibrational spectroscopy for the study of small molecular systems, biological materials, and functional nanostructures. With a focus on Raman, IR, NIR, 2D spectroscopy, and ultrafast laser diagnostics, the Special Issue will explore how these methods provide deep insights into structural, electronic, and dynamic properties across a wide range of materials. We welcome contributions that integrate vibrational spectroscopy, biophysical characterization, surface-enhanced Raman spectroscopy (SERS), and laser-induced material modifications to probe phenomena in fields such as energy conversion, sensing, catalysis, and biointerfaces. Emphasis will be placed on multimodal and in situ/operando spectroscopy, especially when applied to hybrid materials like perovskites, 2D materials, porous structures, and soft matter. By bridging molecular science, spectroscopy, laser processing, and nanomaterials, this Special Issue will provide a platform for interdisciplinary research with both fundamental insights and practical applications in photonics, energy, and life sciences.

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Optics (ISSN 2673-3269) aims at establishing *Optics* as a leading journal for publishing high impact fundamental research and applications in optics field with a fast processing time and high quality service. The journal particularly welcomes both theoretical (simulation) and experimental research within our journal's scope. We encourage scientists to publish their experimental and theoretical results in as much detail as possible. So, there is no restriction on the length or pages of the papers. The full experimental details must be provided so that the results can be reproduced. Electronic files and software regarding the full details of the calculation or experimental procedure, if unable to be published in a normal way, can be deposited as supplementary electronic material.

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