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Preface

Celebrating the Scientific Legacy of Professor Giuseppe Zerbi

Chiara Castiglioni [1], Matteo Tommasini [1] and Rui Fausto [2,3,*]

[1] CMIC, Dipartimento di Chimica, Materiali e Ingegneria Chimica "G. Natta", Politecnico di Milano, Piazza Leonardo da Vinci 32, 20133 Milano, Italy
[2] Spectroscopy@IKU, IKU-SPECTRA Molecular Sciences and Spectroscopy Applied Research Center and Department of Physics, Faculty of Sciences and Letters, Istanbul Kultur University, Atakoy Campus, Bakırkoy, Istanbul 34156, Türkiye
[3] CQC–IMS, Department of Chemistry, University of Coimbra, 3004-535 Coimbra, Portugal
* Correspondence: rfausto@ci.uc.pt
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Photochemistry and Spectroscopy was established to provide a forum for future developments in photochemistry and spectroscopy, two fields that continue to evolve through new ideas and technologies. At the same time, progress in science is rooted in the achievements of the pioneers who laid its foundations. In this spirit, the present volume comprehends the first part of a series of articles dedicated to Professor Giuseppe Zerbi, whose visionary contributions have profoundly influenced molecular spectroscopy and the study of advanced materials.

As early as the 1960s, Professor Zerbi was among the first to recognize the potential of vibrational spectroscopy not only as an analytical tool, but also as a powerful method for investigating the structure and dynamics of molecules, molecular materials, and polymers. Inspired by this insight, he established a truly interdisciplinary school in which chemists, physicists, and engineers trained side by side, harnessing the synergy between experimental and theoretical research. He also pioneered new approaches to explore novel materials through collaborations with leading groups engaged in the design and synthesis of organic materials for molecular electronics and photonics. These efforts led to original contributions to the understanding of π-conjugated materials, including conducting polymers, molecular systems, and graphene-based materials.

The appreciation felt by many for the scientific excellence of Giuseppe Zerbi, as well as for his open, warm, and deeply engaged approach to collaboration and mentorship, is reflected in the many contributions from friends and colleagues who wished to pay tribute to him by submitting manuscripts for this volume. This collection of works spans a wide range of topics, focusing on molecules and materials whose structure, spectroscopic response, and physical behavior are investigated through state-of-the-art experimental techniques or theoretical approaches. Innovative techniques related to the application of spectroscopy in diagnostic fields are also presented.

This richness and diversity of topics further demonstrate how fruitful a cross-disciplinary approach can be in the application of spectroscopy, an approach that Giuseppe Zerbi has always sought to promote.

The response to the invitation to participate in this celebration has been so wide and heartfelt that the editors have decided to include additional contributions, which will be collected in a second volume and published in the summer of 2026.

Giuseppe Zerbi is Professor Emeritus of the *Politecnico di Milano* and a member of the Accademia Nazionale dei Lincei. He began his scientific career as an assistant to Nobel Laureate Giulio Natta at the *Politecnico di Milano*. He later served as Full Professor of Molecular Spectroscopy at the University of Trieste and Director of the Institute of Macromolecular Chemistry of the National Research Council of Italy (CNR) in Milan before returning to the *Politecnico di Milano*, where he held the Chair of Materials Science and Technology.

A pioneer in vibrational spectroscopy, Zerbi combined experimental and theoretical research to elucidate the molecular and electronic structure of materials. He has authored more than 500 scientific papers and received numerous honors, including the Max Planck Society Research Award and the Lippincott Award in Vibrational Spectroscopy. He was elected Fellow of the American Physical Society in 1981.

Academic Editors

Chiara Castiglioni is Full Professor of Materials Science and Technology at the *Politecnico di Milano*. She carried out her scientific training under the guidance of Giuseppe Zerbi, whose mentorship profoundly influenced her research path in molecular spectroscopy and theoretical modeling.

Throughout many years of collaboration, Zerbi transmitted to her not only his deep scientific knowledge and passion for spectroscopy, but also his enthusiasm for research and his appreciation for the intellectual vitality and collaborative spirit that characterize passionate teamwork in science.

Matteo Tommasini is Full Professor of Materials Science and Technology at *Politecnico di Milano*. He has been fascinated by materials and spectroscopy since his MSc and PhD studies, pursued under the inspiring mentorship of Chiara Castiglioni and Giuseppe Zerbi, to whom he owes his scientific training and enduring passion for the field. His research focuses on molecular materials, including graphene molecules, functional materials, and polymers, as well as on the application of surface-enhanced Raman spectroscopy to drug sensing.

Rui Fausto is full Professor at the University of Coimbra (Portugal), and Professor and the ERA-Chair holder of the Spectroscopy@IKU: *Manipulating and Characterizing Molecular. Architectures: From Isolated Molecules to Molecular Crystals* at the Istanbul Kultur University (Türkiye). He is the President of the Steering Committee of EUCMOS, the Editor-in-Chief of *Photochemistry and Spectroscopy*. Rui Fausto has published or edited nearly 50 scientific books and is author of over 500 research articles mostly focusing the photochemistry and spectroscopy of organic molecules and of matrix-isolated reactive intermediates. He is one of the pioneers in using vibrational excitation to induce chemical reactivity in organic molecules under matrix-isolation conditions, and has also an extensive and influential work on the photochemistry of reactive intermediates and quantum mechanical tunnelling.

Conflicts of Interest

The authors declare no conflict of interest.

Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.