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Editorial

Launching a New Forum for Light–Matter Science: On the Inaugural Issue of *Photochemistry and Spectroscopy*

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On behalf of the editors, I am very pleased to announce the launch of **Issue 1** of ***Photochemistry and Spectroscopy***. The appearance of this inaugural issue marks an important milestone in the establishment of a new open-access, peer-reviewed platform devoted to the advancement of research at the interface of light–matter interactions. The journal has been conceived to serve a broad and interdisciplinary scientific community, bringing together researchers working in photochemistry, spectroscopy, photophysics, materials science, molecular sciences, and related theoretical and computational fields. The publication of this first issue is both a culmination of extensive preparatory efforts and a starting point for what we envisage as a dynamic and intellectually vibrant forum for the dissemination of high-quality research.

Photochemistry and Spectroscopy is dedicated to publishing original, cutting-edge contributions that address fundamental and applied questions arising from the interaction of electromagnetic radiation with matter. The journal welcomes short communications, full-length research articles, and review papers covering molecular, materials-based, biological, and astrophysical systems. A distinctive feature of the journal is its explicit encouragement of studies that combine experimental and theoretical approaches, recognizing that modern advances in photochemical and spectroscopic sciences are increasingly driven by the synergy between precise measurements and robust computational modeling. By offering an open-access publishing model, the journal seeks to ensure that new knowledge in these rapidly evolving fields is disseminated widely and equitably, fostering global scientific exchange.

The scientific domains of photochemistry and spectroscopy are deeply rooted in the history of physical sciences, yet they remain at the forefront of contemporary research. From the earliest recognition that light could induce chemical change to the development of sophisticated spectroscopic techniques capable of probing matter on ultrafast timescales and at the single-molecule level, these fields have evolved in parallel and in constant dialogue. Spectroscopy has long served as the primary window through which photochemical processes are observed, quantified, and understood. Conversely, photochemical phenomena have continuously posed new challenges that have driven the development of ever more refined spectroscopic methodologies. Despite this intrinsic interdependence, scholarly publishing has traditionally treated these domains as largely separate disciplines.

One of the defining characteristics of *Photochemistry and Spectroscopy* is its explicit focus on both areas simultaneously. To our knowledge, this journal is unique in placing equal emphasis on photochemical processes and spectroscopic investigation within a single, integrated editorial scope. This dual focus reflects the reality of contemporary research, where the interpretation of photochemical reactivity, excited-state dynamics, and energy-transfer processes is inseparable from spectroscopic observation and analysis. By providing a common home for these closely intertwined fields, the journal aims to promote cross-fertilization of ideas, methodologies, and conceptual frameworks that might otherwise remain compartmentalized.

Historically, the relevance of photochemistry and spectroscopy has been demonstrated repeatedly through transformative scientific advances. The formulation of fundamental principles governing electronic excitation,

relaxation, and energy transfer has shaped our understanding of chemical bonding, reactivity, and molecular structure. Spectroscopic techniques, developed either as steady-state or time-resolved techniques, have become indispensable tools across chemistry, physics, biology, materials science, and astronomy. In parallel, photochemistry has underpinned developments ranging from atmospheric chemistry and solar energy conversion to photobiology, photocatalysis, and molecular electronics. Today, these fields are more relevant than ever, addressing global challenges such as sustainable energy production, environmental monitoring, advanced functional materials, and the chemical evolution of matter in extreme environments.

The four manuscripts presented in this inaugural issue exemplify the breadth, depth, and integrative spirit that *Photochemistry and Spectroscopy* seeks to cultivate.

The first contribution, by Kundu, Venkataravana and Chattopadhyay [1], offers a comprehensive photophysical analysis of a series of 1,2-dicarbonyl compounds, addressing long-standing questions concerning excited-state behavior and emission mechanisms. By combining steady-state and time-resolved emission spectroscopy with advanced quantum-chemical calculations, the study provides compelling evidence that emission from higher excited singlet states (S_2 emission) is not a general characteristic of this molecular family but rather a system-specific phenomenon governed by electronic structure and conformational dynamics. The work challenges conventional interpretations rooted in Kasha's rule and demonstrates how subtle variations in molecular geometry and potential energy landscapes can profoundly influence photophysical outcomes. This study epitomizes the journal's mission by tightly coupling spectroscopic observation with photochemical and photophysical interpretation, supported by theoretical modeling.

In the second manuscript [2], Ocola and Laane focus on intramolecular π-type hydrogen bonding in small cyclic molecules, investigated through a combination of high-level ab initio quantum-chemical calculations and infrared and Raman spectroscopy. The study reveals how weak intramolecular interactions shape conformational preferences and vibrational signatures in the gas phase. By refining energetic descriptions using CCSD(T)-level calculations and correlating them with spectroscopic observables, the work underscores the power of spectroscopy as a diagnostic tool for subtle structural effects. At the same time, it highlights how theoretical insight is essential for interpreting experimental spectra and for understanding the energetic and structural consequences of weak bonding interactions. This contribution bridges fundamental molecular spectroscopy with broader questions of molecular stability, conformational control, and chemical reactivity.

The third article, by Góbi, Keresztes and Tarczay [3], explores the radiation-induced chemistry of amorphous thioacetamide ices under energetic electron bombardment at cryogenic temperatures, simulating conditions relevant to astrochemical environments. Mid-infrared spectroscopy, temperature-programmed desorption, and density functional theory calculations are combined to elucidate decomposition pathways and product formation in both pure and water-containing ices. This study demonstrates how spectroscopic monitoring under controlled photochemical and radiolytic conditions can reveal complex reaction networks in low-temperature solids. The work connects laboratory spectroscopy with photochemistry and radiation chemistry in space, illustrating how molecular-level processes observed experimentally inform our understanding of chemical evolution in astrophysical contexts.

The fourth contribution examines the dielectric behavior, diffuse phase transitions, and optical band gap of polycrystalline ferrite ceramics. Through dielectric spectroscopy, UV-visible absorption measurements, and structural characterization, the study of Mounir et al. [4] establishes links between phase behavior, electronic structure, and functional properties relevant to energy storage, optoelectronics, and photocatalysis. While focused on a solid-state material system, the work reinforces the central role of spectroscopic techniques in probing optical and electronic properties and demonstrates how these properties are intrinsically connected to light-matter interactions. This contribution broadens the scope of the issue toward materials photochemistry and applied spectroscopy, reinforcing the journal's inclusive and interdisciplinary vision.

Taken together, the manuscripts in this inaugural issue illustrate how photochemistry and spectroscopy operate most powerfully when treated not as isolated disciplines, but as mutually reinforcing perspectives on the same physical reality. From molecular excited-state dynamics and weak intramolecular interactions to radiation-driven chemistry in ices and light-responsive functional materials, these studies highlight the diversity of systems and scales accessible through combined photochemical and spectroscopic approaches. They also reflect the journal's commitment to methodological rigor, conceptual clarity, and interdisciplinary relevance.

With the publication of this first issue, *Photochemistry and Spectroscopy* sets out to become a central forum for researchers seeking to understand and harness light-matter interactions in all their complexity. We invite the scientific community to engage with the work presented here and to contribute future studies that push the boundaries of photochemical and spectroscopic science. We look forward to the continued growth of the journal and to the vibrant exchange of ideas that it aims to foster.

As Editor-in-Chief, it is my privilege to present this inaugural issue of *Photochemistry and Spectroscopy*. The journal was founded with the conviction that photochemistry and spectroscopy, while historically intertwined, require a dedicated and unified platform to fully reflect their contemporary scientific scope and impact. I sincerely thank the authors for their high-quality contributions and the editorial board members for their commitment and vision. I also gratefully acknowledge the support of Ms. Avril Zhang and her team at Scilight, whose efforts have been essential to the successful launch of this journal.

I warmly invite researchers from across disciplines to engage with the journal, to contribute their most rigorous and innovative work, and to help shape *Photochemistry and Spectroscopy* into a lasting and influential forum for the global light-matter science community.

Conflicts of Interest

The author declares no conflict of interest.

Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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