



30th International Conference on Photochemistry (ICP2021): an introduction by the Guest Editors

Alexandre Fürstenberg^{1,2} · Tatu Kumpulainen³

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This virtual special issue of *Photochemical & Photobiological Sciences* contains a selection of papers related to the 30th International Conference on Photochemistry (ICP2021) held online on July 19–23, 2021. Guided by the ICP's international advisory board, the aim of the local organizing committee of the conference was to provide a platform for the leading scientists and companies from all over the world to share their latest findings in photochemical, photophysical and photobiological sciences. The conference was originally planned to take place in Geneva, Switzerland, but due to concerns over the global health situation, the conference was eventually held virtually using a professional online conference platform. The event was financially supported by the University of Geneva, the Swiss Chemical Society, the European Photochemistry Association (EPA), the International Foundation of Photochemistry (IFP), together with several international companies and scientific journals including *Photochemical & Photobiological Sciences*.

ICP is one of the oldest and most established conference series dedicated to photosciences. It is organized biennially alternating with the other large conference in the field, the IUPAC Symposium on Photochemistry. The 30th ICP, chaired by Prof. Eric Vauthey, was announced during the preceding conference in Boulder Colorado in 2019 and planning for the physical meeting in Geneva started soon after. Unfortunately, the emergence of the COVID-19 pandemic

shook the scientific world resulting in cancellation or postponement of nearly all scientific meetings in 2020. In response to the prolonged tense global health situation, the local organizing committee decided to organize ICP2021 as a fully virtual event instead of postponing it by two years. Hopefully, the 31st ICP, to be organized in 2023 in Sapporo, Japan, will take place as planned as an in-person meeting.

ICP2021 gathered over 450 participants from 36 countries in five continents in front of their computers. Over 70% of participants were from European countries, with particularly high attendance from Germany, Switzerland, and France. Despite the inconvenience caused by the time difference, close to 50 participants attended the meeting from Japan and 30 from the USA, Asia representing 17% and North America 7% of the total participants.

The scientific program consisted of 9 plenary and 35 invited lectures in addition to 160 short oral contributions and nearly 140 virtual posters. Five parallel sessions grouped into 13 separate themes featured a vast range of topics from fundamental photochemistry and solar energy conversion to plasmonics and light-responsive materials. The plenary lectures given by leading scientists in their fields showcased the breadth of areas in which photosciences are particularly influential. Prof. Michel Orrit (Leiden University) reminded the audience how photochemical sciences enabled the field of single-molecule spectroscopy and imaging and featured how plasmonics influence the photophysical behavior of particles and molecules in a way that enables unprecedented probing of the nanoscale. Prof. Katja Heinze (JGU Mainz) proposed several avenues to efficiently achieve earth-abundant metal-centered spin-flip emission of molecular coordination complexes, which find applications in circularly polarized luminescence or as molecular thermometers. Prof. Hiroko Yamada (NAIST, Japan) demonstrated various strategies for the synthesis of large acenes utilizing light and temperature sensitive precursors. Prof. Kris McNeill (ETH Zürich) detailed how the triplet states of dissolved organic matter play key roles in natural photodegradation processes

✉ Alexandre Fürstenberg
alexandre.fuerstenberg@unige.ch

Tatu Kumpulainen
tatu.s.kumpulainen@jyu.fi

¹ Department of Physical Chemistry, University of Geneva, Quai Ernest-Ansermet 30, 1211 Geneva 4, Switzerland

² Department of Inorganic and Analytical Chemistry, University of Geneva, Quai Ernest-Ansermet 30, 1211 Geneva 4, Switzerland

³ Department of Chemistry/Nanoscience Center, University of Jyväskylä, Survantie 9 C, 40500 Jyväskylä, Finland

of pollutants. Prof. Roberta Croce (VU Amsterdam) explained how plants and bacteria can utilize far-red light for oxygenic photosynthesis. Prof. Chi-Ming Che (HKU Hong Kong) described how to take advantage of the photophysics and photochemistry of d^6 and d^8 metal complexes with open coordination sites for photocatalysis, for making improved OLEDs or for biomedical applications. Prof. Garry Rumbles (NREL Colorado) showed how dielectric spectroscopy can be utilized to investigate the generation and mobility of free charge carriers in organic photovoltaic materials. Prof. Leticia González (Uni Vienna) demonstrated how ultrafast dynamics in transition metal complexes can be accurately modelled using surface-hopping molecular dynamics simulations. Last, Prof. Johan Hofkens (KU Leuven) focused on how looking at single molecules has changed the way science is performed and introduced revolutionary ways of achieving DNA sequencing by optical super-resolution mapping.

In addition to the regular scientific program, the meeting also featured an award ceremony to congratulate the laureates of several prizes awarded by the European Photochemistry Association (EPA), who all delivered outstanding prize lectures. The EPA PhD Prize 2020 for the best thesis in photochemistry went to Dr. Bogdan Dereka (University of Geneva) for his work on symmetry-breaking charge separation. The EPA PPS Prize 2020 was awarded to Prof. Bo Albinsson (Chalmers University of Technology) for his highly cited article on increasing the efficiency of triplet–triplet annihilation photon upconversion by oxygen scavenging [1]. Dr. Haining Tian (Uppsala University) was the recipient of the newly established EPA Young Investigator Award 2021 for his research on molecular devices for artificial photosynthesis. Finally, the first European Ambassador of Photochemistry Award (2021) was given to Prof. Silvia Braslavsky for her relentless and intercontinental service to the photoscience community. At the end of the meeting, with the support of commercial sponsors, the best six short oral and poster contributions presented by PhD students and post-docs during the meeting were also recognized, with Alex Cravenco (University of Gothenburg) and Emilie Renouard

(Ecole Normale Supérieure) collecting the top prizes for the best oral and poster contributions, respectively.

The purpose of this special issue is to preserve a recollection of the 30th International Conference on Photochemistry and highlight some of the science presented during the meeting. The special collection was open for submissions from all participants in the form of perspectives, reviews, and original research articles. The review by Heinze and coworkers focuses on the unique properties of spin-flip emitters and their distinctive design strategies. Albinsson and coworkers suggest best-practice procedures to determine key photophysical parameters in triplet–triplet annihilation photon up-conversion. Yamada and coworkers summarize the recent progress in the synthesis of oligoacenes as well as their electronic properties. In their perspective article, Ogilby and coworkers provide a brief historical review and discuss the present challenges and future research directions on the photophysics of molecular oxygen perturbed by adjacent molecular guests. The review article of Claire Richard and coworkers discusses the role of plant leaves in photochemical degradation kinetics and mechanisms of volatile organic compounds. Similarly to the breadth of topics covered in the ICP2021, the original research articles of this special issue feature a wide range of topics from inorganic photochromic materials to high-level *ab initio* calculations.

The guest editors wish to express their gratitude towards all authors and participants for their contributions to this special collection and to the ICP2021 symposium. They also wish to warmly thank the editorial team of *Photochemical & Photobiological Sciences* for their valuable assistance during the editorial process.

Reference

1. Dzebo, D., Moth-Poulsen, K., & Albinsson, B. (2017). Robust triplet–triplet annihilation photon upconversion by efficient oxygen scavenging. *Photochemical & Photobiological Sciences*, 16, 1327–1334.