

Editorial



Dr. Ludovic Gremaud



Dr. Fabrice Gallou

In the last few years, the Swiss Chemical Society started to intensify their efforts towards a collective response to sustainability *via* the Green & Sustainable Chemistry Network.^[1] The Network brings together actors from the unique and rich Swiss academic and industrial ecosystems. It has developed strategies to tackle meaningful aspects of sustainability, and in particular integrate these into the education of students, current practitioners, and executives. This year is no exception with the Swiss Green & Sustainable Chemistry Days hosted during the ilmac trade fair,^[2] and this highly anticipated special issue of *CHIMIA*. In this current issue, on purpose, we sought an international perspective, to highlight the magnitude of the challenge and the need for a collective response. Our objective was to showcase and highlight how methodologies and technologies can change the mindset, leading to better practices and aid in the transition from a linear economy to a more circular one. Our vision was to bring together a diverse panel of experts to build a balanced and informative issue covering some trends and outlooks: on the opportunities that automation and recent digital advances enable (Dr. Roch); around the application of circular economy principles applied to solvent selection within process design (Dr. Luescher); on the use of mechanochemistry to enable a time-efficient and accurate simulation of degradation pathways under mild reaction conditions in solid-state (Profs. Holzgrabe and Bolm); on the difunctionalization of alkynes using a bifunctional reagent to achieve with perfect atom economy, high regio- and stereoselectivity (Prof. Chatterjee); for the direct modification of valuable *para*-quinones *via* photoredox catalysis (Prof. Dhar); on the impact of photochemistry transformations to generate *in situ* hazardous alkyl diazoacetate and their subsequent reaction towards oxindoles (Profs. Bera and Sen); and finally on the development of a Failure Modes and Effects Analysis (FMEA) risk assessment to evaluate the criticality of process parameters and material attributes involved in a *Pseudomonas aeruginosa* phage production process (Prof. Jungo).

The development of responsible science and technology is undoubtedly necessary, but notable progress and sustainable results cannot come without a collective drive and the active involvement of many actors from the social, economic, political, cultural, and ethical landscape. Innovation is a must in all fields, as we continue to scorch the earth and bring our ecosystem to its limits. Fair access to state-of-the-art science and technologies is key to success. Without diminishing the value of the science behind the work required, and rather focusing on the simplicity of its implementation, easily replicable technologies, will make the difference.

What can be seen from this special issue is the urgency and breadth of the challenges, hence the obvious need for sustained research on *Green & Sustainable Chemistry*, if we want to have a chance to rapidly reverse some of the challenging trends which could potentially lead to irreversibility. A genuine collective, and collaborative effort is hence required to have a chance to rapidly address our current challenges. There are clear and still not optimally exploited synergies between academia and industry! We hope that these interesting accounts will quench your thirst on this critical topic of sustainability and bring additional, necessary, inspiration to develop new ideas, and shape new collaborations across the field. We wish you an enjoyable read!

Dr. Ludovic Gremaud
Haute école d'ingénierie et d'architecture de Fribourg

Dr. Fabrice Gallou
Novartis

[1] Swiss Chemical Society – Suschem, accessed on August 4, 2025.

[2] Swiss Chemical Society – Home, accessed on August 4, 2025.

The CHIMIA Editorial Board is very grateful to Dr. Ludovic Gremaud and Dr. Fabrice Gallou for their great efforts in organizing this issue on *Green & Sustainable Chemistry: Trends and Outlooks* showcasing an international perspective on how methodologies and technologies can change the mindset, leading to better practices and aid in the transition from a linear economy to a more circular sustainable one.

Cover image created by Dr. Fabrice Gallou based on the 'Cyclop', a sculpture by Jean Tinguely and Niki de Saint Phalle, created in collaboration with their artistic 'family'. This remarkable and gigantic piece of art is the assembly of independent and creative pieces, designed and located on purpose for its environment, in the middle of a quiet forest near busy Paris. It is constructed for the most parts found objects, scrap metal, or detritus. Tinguely's kinetic sculpture leaves visitors obviously with the impression of movement, but also that of harmony and sustainability, coming from the peaceful flow of water, and the quiet and dense forest. This sculpture exemplifies how science and chemistry in particular can be executed sustainably manner, respecting the environment, designed with the right mindset and executed collectively.