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Exploring Green Chemistry's Contribution in Circular Economy: Transforming Territorial Challenges into Innovative Solutions (invited conference)

Gregory Chatel

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THE
ROYAL
SOCIETY

Joint scientific workshop on Green Chemistry

Paris, October 19th-20th 2023

Exploring Green Chemistry's Contribution in Circular Economy: Transforming Territorial Challenges into Innovative Solutions

Dr. Gregory CHATEL

The significant role of green chemistry in circular economy projects will be discussed, with a particular emphasis on territorial approaches for waste and biomass valorization and the utilization of unconventional activation methods such as sonochemistry, microwave chemistry, and pressurized fluids. The presentation will showcase several examples of projects that utilize these innovative techniques for the production of valuable molecules within the context of the bioeconomy and circular economy. Emphasis will be placed on the importance of multidisciplinary collaboration and territorial strategies in achieving sustainable solutions. Several case studies will be presented, including a local-scale project that focuses on the valorization of viticultural waste through a cascade of valorization processes and various applications. Additionally, the establishment of a start-up dedicated to the valorization of invasive plants for favouring the biodiversity preservation, utilizing an innovative laboratory-developed process, will be highlighted. Furthermore, an initiative that utilizes supercritical CO₂-based processes to valorize coffee grounds collected from local restaurants for the production of molecules of interest in cosmetic and nutraceutical applications will be discussed. The presentation will also delve into recent research on the valorization of apple pomace for antibacterial applications. More globally, the integration of green chemistry strategies through multidisciplinary and multi-actor approaches is essential for effectively transforming territorial challenges into innovative solutions.

Some recent publications on the subject:

M. Zwingelstein, M. Draye, C. Piot, J.-L. Besombes, G. Chatel,* *ACS Sustain. Chem. Eng.* **2019**, *7*, 8310

G. Chatel,* *Chem. Eur. J.* **2020**, *26*, 9665.

A. Vandepoose, M. Draye, C. Piot, G. Chatel,* *Green Chem.* **2020**, *22*, 8544

G. Chatel,* R. Duwald, M. Draye, P. Fanget, C. Piot, *Patent WO2021250251A1*, **2021**.

V. Quinty, C. Colas, R. Nasreddine, R. Nehmé, C. Piot, M. Draye, E. Destandau, D. Da Silva,* G. Chatel,* *Plants* **2023**, *12*, 83



Dr. Gregory CHATEL is an Associate Professor at the EDYTEM laboratory (Savoie Mont Blanc University/CNRS). He obtained his PhD degree from the University of Grenoble in 2012 under the supervision of Prof. Micheline DRAYE and Prof. Bruno ANDRIOLETTI. Afterward, he joined the research group of Prof. Robin D. ROGERS at The University of Alabama (USA) as a postdoctoral fellow to work on ionic liquids for applications in the fields of space propulsion, biomass valorization, and separation. Towards the end of 2013, he was recruited as an Assistant Professor at the Institut de Chimie des Milieux et Matériaux de Poitiers (IC2MP, Université de Poitiers/CNRS, France). Additionally, at the national level, he founded and served as the first president of the Young Chemists' network of the Société Chimique de France. In 2016, Dr. CHATEL joined the Savoie Mont Blanc University to focus on research in green chemistry for the valorization of biomass and waste, as well as the reevaluation of fine chemical processes. He successfully completed his habilitation in 2018 and currently holds the position of Associate Professor at the EDYTEM Institute (Université Savoie Mont Blanc/CNRS). In recognition of his contributions, he was awarded the silver medal of the *European Young Chemists Award* by the European Chemical Society (EuChemS) in 2020.

In addition, Dr. CHATEL established a new Master's Degree program in *Green Chemistry and Eco-Innovations* at Savoie Mont Blanc University from 2021 and was honoured with the *teaching-training prize* from the French Chemical Society in 2023. Presently, he actively co-supervises the *Circular Economy* axis of the CLEE Chair sponsored by USMB Foundation.