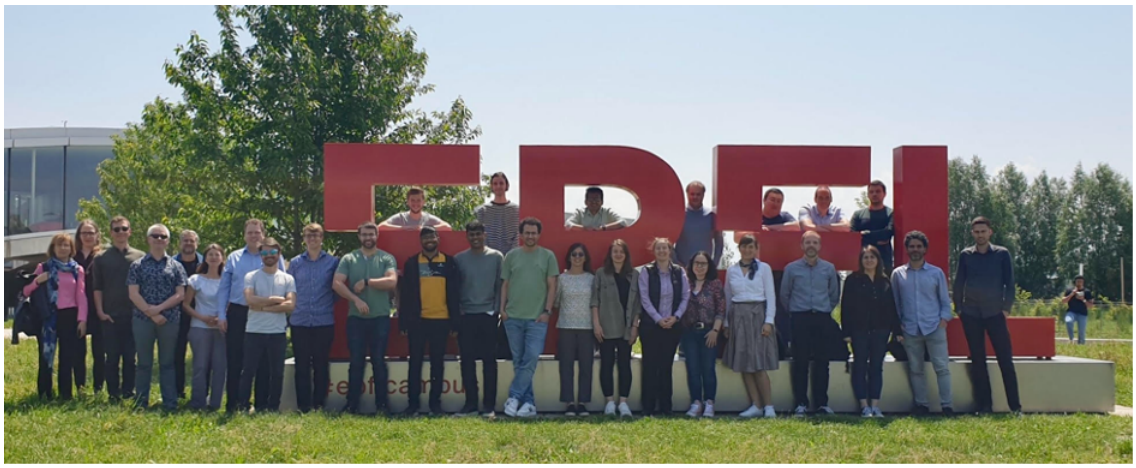
Newsletter - June 2023

Learn about our meeting in Lausanne and our new publications, meet the Boss (Dr Pau Farràs, University of Galway) and more…..

All together now!
Project team meets in Lausanne

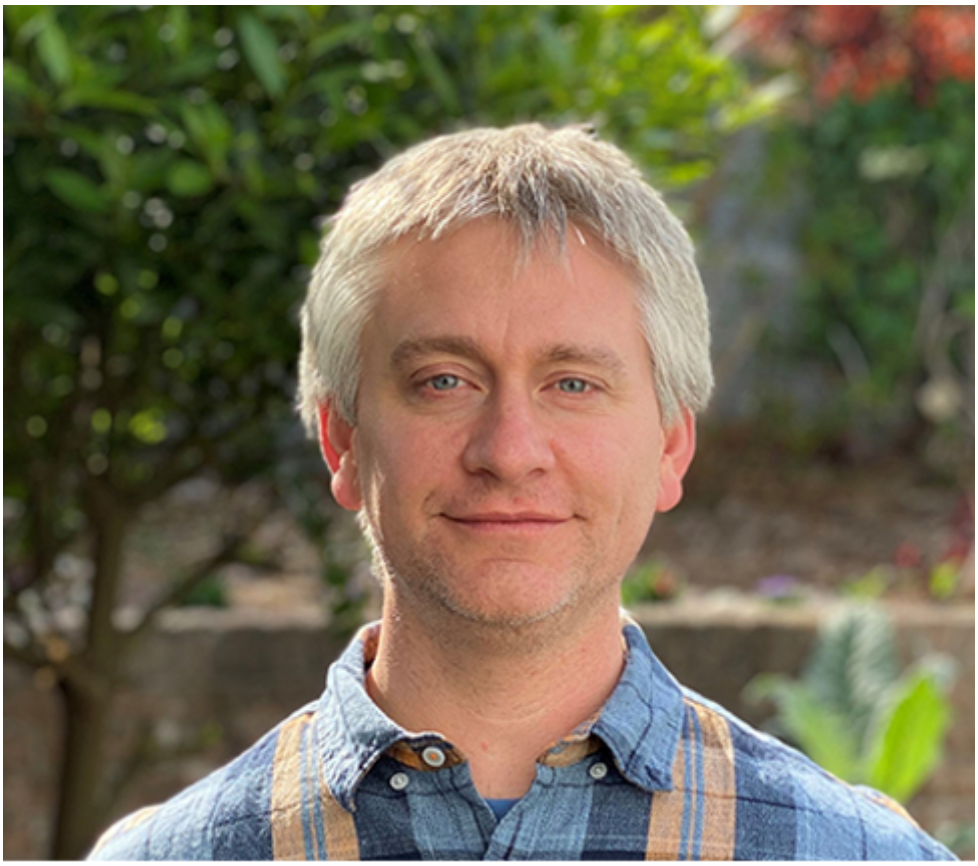


The FlowPhotoChem team was in attendance in force at the project-wide plenary meeting in Lausanne, Switzerland on the 25th and 26th of May, 2023. Members of our Scientific and Exploitation Advisory Boards joined us to question and guide us further with our research. Special thanks to our advisors Dr Huyen Dinh, Dr Stafford Sheehan and Marc Lavine for joining.

We had a productive meeting as we enter an exciting phase of the project with our modular reactors starting to generate results and systems integration advancing. We were treated to an engaging tour of the labs and installations at the Ecole Polytechnique Federale De Lausanne (EPFL). Many thanks to the EPFL team for hosting!

Check out our News and Twitter feeds for the latest project updates!

Meet the Boss!



In his recent interview, Coordinator Dr Pau Farràs, University of Galway, described the FlowPhotoChem project to develop and scale up solar energy conversion technologies.

The FlowPhotoChem project covers different types of reactors and their integration to produce a range of fuels and chemicals. In Pau's experience,

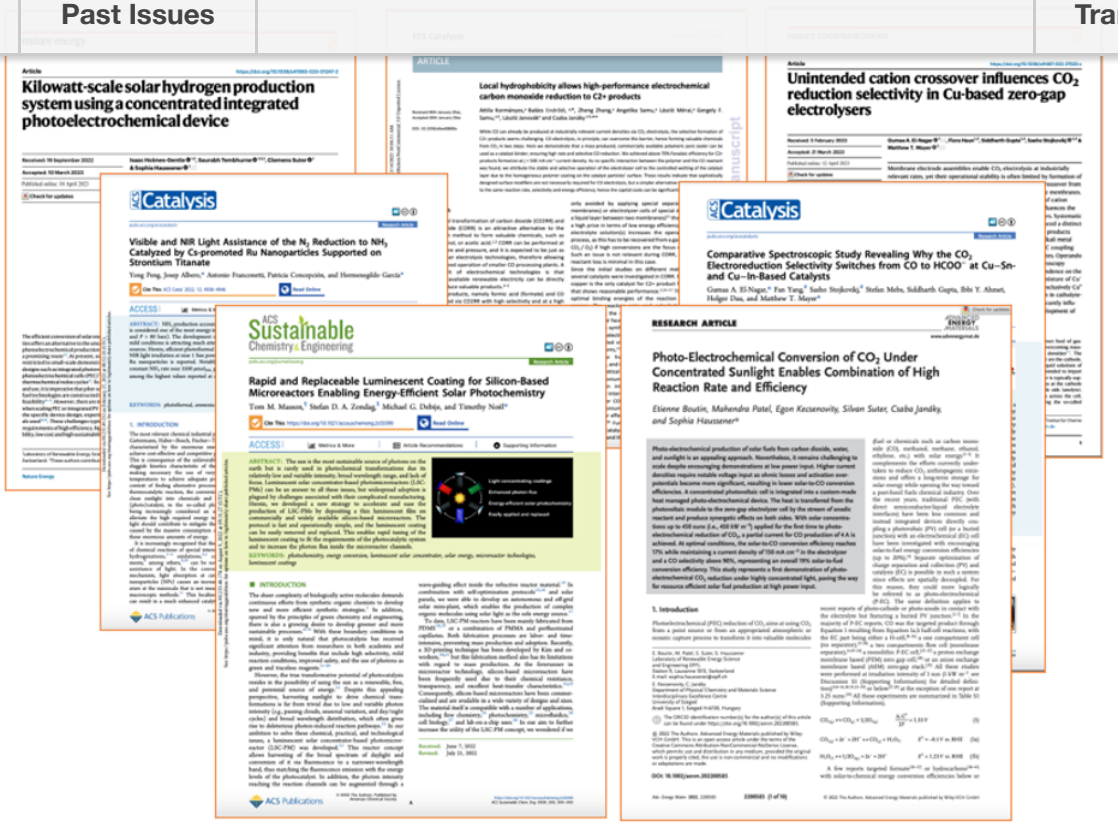
"The cross-pollination of ideas between the different groups is fascinating and allows all partners to go beyond the state of the art."

Pau's research group, ChemLight based at the University of Galway, is leading/coordinating the FlowPhotoChem project. Pau reports that the project is an incredible experience that has allowed his team to explore new avenues of research, as well as to collaborate with leading research groups. In the technical domain, the University of Galway's role is to develop new oxygen-evolving reaction (OER) electrocatalysts with high activity and stability under both acidic and alkaline conditions, to replace the benchmark precious metals.

"*The collaboration with FlowPhotoChem partners has allowed us to focus on the preparation of materials, while the testing in photoelectrochemical and electrochemical reactors is done in our partners' facilities*."

Read the complete interview here.

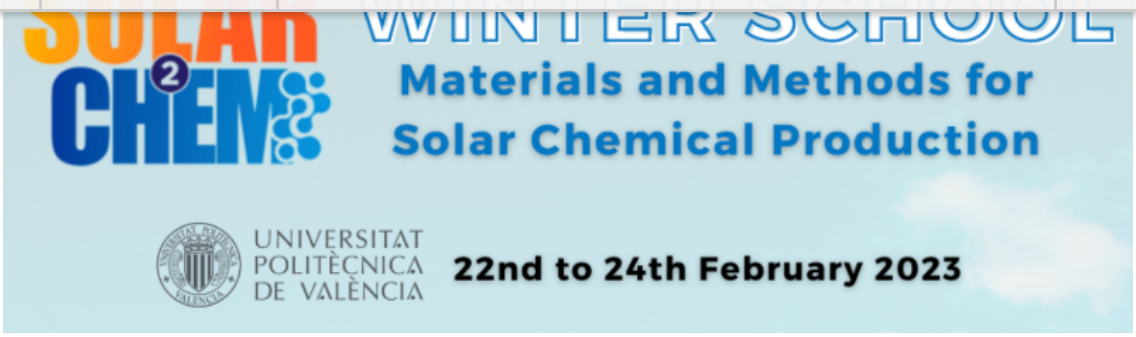
New FlowPhotoChem publications



Seven FlowPhotoChem papers have been published since our last newsletter in November 2022. The recent papers come from partners at Helmholtz-Zentrum Berlin, EPFL, the University of Szeged, the Polytechnic University of Valencia, and the University of Amsterdam. Lay summaries of four of these papers are available on our website. Visit our Publications page for the entire list.

Keep an eye on our Zenodo Community for publications news too!

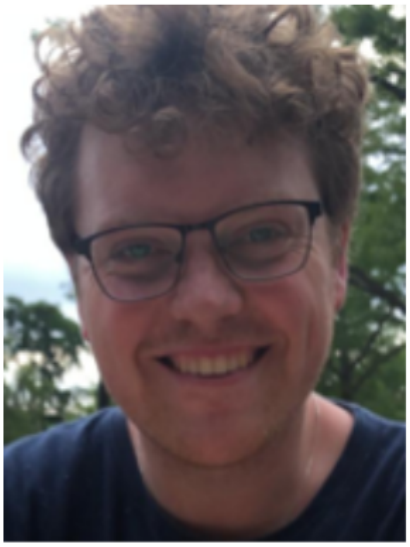
Training the next generation of researchers for solar chemicals production

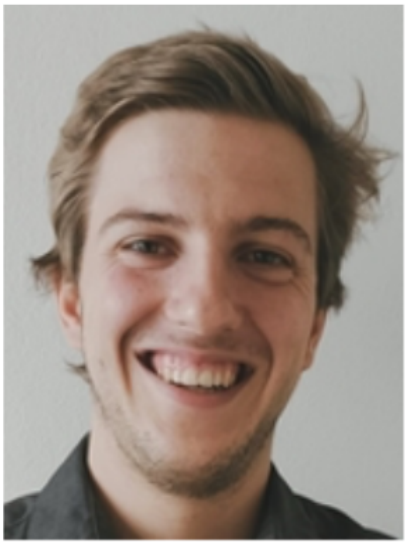


The Solar2Chem project's (Marie-Skłodowska-Curie Grant Agreement No. 861151) Winter School "Materials and Methods for Solar Chemical Production", took place at the Universitat Politècnica de València (UPV) from the 22nd to the 24th of February 2023. The event hosted 80 early-stage and post-doctoral researchers who learnt the new trends of research about solar fuels production, interacted with each other during the networking activities, presented their research at the poster sessions and much more!

University of Galway PhD candidate Hanka Besic attended the Valencia Winter School and provides her take on the training here.

Early Stage Researcher vlog - Results are rolling in!





University of Amsterdam 3rd-year PhD candidates Stefan Zondag (L) and Tom Masson (R), who are supervised by Professor Timothy Noel, created a 2023 video update on the progress and troubleshooting going on behind the scenes

testing a new high-temperature, luminescent solar concentrator micro-reactor for CO_2 conversion. Learn more about this work in their vlog.

Check out our complete series of ESR vlogs on our Media page!

FlowPhotoChem's Research Network

Co2smos (Grant Agreement No. 101000790) is developing a platform of technologies to transform CO_2 emissions produced by bio-based industries into a set of high value-added chemicals with direct use as intermediates for bio-based products. Specifically, it will create a toolbox combining intensified chemical conversions (electrocatalytic and membrane reactors) and innovative biotechnological solutions based on gas/liquid combined fermentation processes and organic/green-catalysts reaction processes. The Co2smos will contribute to the sustainability and cost competitiveness of the integrated conversion processes. The University of Amsterdam team is developing an efficient co-electrolysis technology that combines the chemical reduction of CO_2 with the production of value-added chemicals. With the Amsterdam-based company Avantium, the academic research group is establishing the novel co-electrolysis concept's technological, economic and environmental viability.

Vivaldi (Grant Agreement No. 101000441) is developing an innovative,

sustainable, and cost-efficient biotechnological solution to convert off-gas emissions from bio-based industries into CO_2-based chemicals. In this way, the industry's greenhouse gas emissions will not only be reduced but will be used as a novel feedstock, lowering the dependency on fossil fuels import and the exploitation of key resources such as energy, raw material, freshwater and land. FlowPhotoChem partner LEITAT Technological Center's role in VIVALDI is to help develop a Bioelectrochemical System (including selective membranes, reactor design, process optimization and scaling-up) for energy-efficient and selective nutrient recovery from industrial Bio-based Industry wastewater streams from their final use in *Pichia pastoris* fermentation. LEITAT also participates on the Innovation Board.

CatCo2nvers (Grant Agreement No. 101000580) aims to reduce greenhouse gas emissions from the bio-based industry by developing five innovative and integrated technologies based on three catalytic processes (electrochemical, enzymatic, and thermochemical). The objective is to transform waste-CO_2 from two bio-based industries into five added-value chemicals: glyoxylic acid, lactic acid, furan dicarboxylic methyl ester, cyclic carbonated fatty acid methyl esters, and bio-methanol, with application in the chemical, cosmetics, and plastic industries. Our partner Johnson Matthey's role in CatCo2nvers is through the Johnson Matthey Technology Centre based in the UK. Their main activity is the development of enzymes for lactic acid production from CO_2 and bioethanol. JMTC facilities foster the development of new technologies into emerging market applications.

More related research projects are listed on our project website here.

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