

International Solar Fuels Conference 2021

26–29 July 2021, Online



Main Programme

Wednesday 28 July (BST)

Time	Session
13:30	Welcome by committee Vincent Artero, Leif Hammarström, Ann Magnuson, Eric Marechal
13:40	Opening lecture: Solar-Driven Water Splitting Harry Gray <i>Caltech, USA</i> <i>Session chair: Vincent Artero, Leif Hammarström</i>
14:00	Q&A / Discussion <i>Session chair: Vincent Artero, Ann Magnuson</i> Fuels and chemicals from CO₂ and renewable electricity Ted Sargent, University of Toronto, Canada Artificial Photosynthesis for Chemical Transformation Li-Zhu Wu, Chinese Academy of Sciences, China Metabolic engineering of cyanobacteria for production of solar fuels and chemicals Pia Lindberg, Uppsala Universitet, Sweden <i>All plenary talks will be available to view for 1 week prior to the conference, and we encourage attendees to submit any questions prior to this discussion session. Information on viewing these sessions will be shared with registered attendees closer to the conference date.</i>
14:30	Break “Meet the editor” networking room open

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Parallel subject sessions			
	Topic 1 - Multi-electron/multi-proton catalysis (homogeneous, heterogeneous, enzymatic and bioinspired processes) Session Chair: Abhishek Dey <i>Indian Association for the Cultivation of Science (IACS), India</i>	Topic 2 – Photobiological approaches and Metabolic engineering Session Chair: Paul King <i>National Renewable Energy Laboratory (NREL), USA</i>	Topic 3 – Photoelectrochemistry Session chair: Mei Wang <i>Dalian University of Technology, China</i>
15:00	Keynote lecture: Orchestrating H⁺ and CO₂ Delivery for Selective Homogeneous Electrocatalytic CO₂ Reduction Jenny Yang <i>University of California Irvine, USA</i>	Keynote lecture: Lipid remodeling under phosphate starvation in microalgae and its application for metabolic engineering Hiroyuki Ohta <i>Tokyo Institute of Technology, Japan</i>	Keynote lecture: Photosynthesis on an electrode Jenny Z. Zhang <i>University of Cambridge, United Kingdom</i>
15:30	Insights into metal-hydride formation for electrocatalytic oxidation reactions Kate Waldie <i>Rutgers, The State University of New Jersey, USA</i>	Hydrogen production by new microbe-based biohybrid systems Monica Martins <i>ITQB NOVA, Portugal</i>	Water splitting: role of the catalyst and mechanistic studies Laia Francàs <i>Universitat Autònoma de Barcelona, Spain</i>
15:40	The electrocatalytic formation of hydrogen peroxide Dennis Hetterscheid <i>Leiden Institute of Chemistry, Netherlands</i>	Metabolic engineering of cyanobacteria for improved terpenoid biosynthesis João Rodrigues <i>Uppsala University</i>	Multi-potential photoelectrodes for cascade photoelectrochemistry Ann Greenaway <i>National Renewable Energy Laboratory, USA</i>
15:50	Advancing the Anode Compartment for Electrochemical CO₂ Reduction Charles Creissen <i>College de France, France</i>	Photocatalytic N₂-to-NH₃ reduction in a CdS quantum dots-nitrogenase system utilizing electron transfer mediators Artavazd Badalyan <i>Utah State University, USA</i>	Extending the use of halide perovskites from photovoltaics to photoelectrochemistry by using graphite protecting layers Salvador Eslava

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			Imperial College London, United Kingdom
16:00	Break		
16:00	Break session: Energy journals and Open Science at the RSC May Copsey and Grace Thoburn <i>Royal Society of Chemistry</i>		
16:45	Multi-electron/multi-proton catalysis (homogeneous, heterogeneous, enzymatic and bioinspired processes) Chair: Bertrand Reuillard Flash poster presentations (4 minutes) Electrocatalytic CO₂ conversion with {Mn(CO)₃Br} molecular sites into Covalent-Organic Frameworks Geyla Caridad Dubed Bandomo <i>ICIQ, Spain</i> Molecular Electrocatalysis in Metal-organic frameworks Sascha Ott <i>Uppsala University, Sweden</i> In operando measurements of local solution pH within gas diffusion electrodes for electrochemical CO₂ reduction Alex Welch <i>Caltech, USA</i> A novel metalacyclic intermediate provides a low-energy C-O bond	Photobiological approaches and Metabolic engineering Chair: Eric Marechal Flash poster presentations (4 minutes) How Far-Red Photons Drive Oxygenic Photosynthesis Abhishek Sirohiwal <i>Max Planck Institute for Chemical Energy Conversion, Germany</i> Orientational Jahn–Teller Isomerism in the Dark-Stable State of the Oxygen Evolving Complex Maria Drosou <i>University of Athens, Greece</i> Revealing the dimeric nature of the primary acceptor in photosystem I Michael Gorka <i>Penn State University, USA</i> Modular Assembly of Photosensitized Biomolecular Nanowires: Novel Biohybrid Materials to Inspire Semi-Artificial Photosynthesis	Photoelectrochemistry Chair: Vincent Artero Flash poster presentations (4 minutes) Hybrid Antimony Selenide - NiP molecular catalyst photocathode for hydrogen evolution Dora Alicia Garcia Osorio <i>University of Liverpool, UK</i> Investigation of carrier injection from semiconductor photocatalyst to cocatalyst by time-resolved XAFS Tomoki Kanazawa <i>Institute of Material Structure Science, High Energy Accelerator Research Organization, Japan</i> Visible Light Driven CO₂ Reduction on Poly-Pyrrole Assembled Supramolecular Ru (II) Photocathodes Coupled with Water Oxidation Fazalurahman Kuttassery <i>University of Calicut, India</i>

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	<p>cleavage pathway for electrochemical CO₂ reduction Hemlata Agarwala <i>Uppsala University, Sweden</i></p> <p>Copper carbonate hydroxide as CO precursor in CO₂ electroreduction Shan Jiang <i>Freie Universität Berlin, Germany</i></p>	<p>Julea Butt <i>University of East Anglia, UK</i></p> <p>Effect of a strong heterologous electron sink on the photosynthetic apparatus in <i>Synechocystis</i> sp. PCC 6803 Michal Hubacek <i>University of Turku, Finland</i></p> <p>Construction and characterization of an artificial cobaloxime based metalloenzyme Sigrid Berglund <i>Uppsala University, Sweden</i></p>	<p>Tuning the Stability and Electron Injection Properties of Ruthenium(II) Complexes by Incorporating Different Functional Groups Langqiu Xiao <i>University of Pennsylvania, USA</i></p> <p>Electron-hopping across a dye-sensitised NiO surface Sina Wrede <i>Uppsala University, Sweden</i></p>
17:15	<p>Best of Young presentations Session chair: Holly Jayne Redman</p> <p>Haem protein scaffolds for photoactivated ruthenium and cobalt water-oxidation catalysts Laura Opdam <i>Leiden Institute of Chemistry, Netherlands</i></p> <p>Molecular Photosystems hosted by Metal-Organic Frameworks for Solar CO₂ Reduction Philip Stanley <i>Technical University of Munich, Germany</i></p>		
17:35	Poster Session		
19:00	Close of formal sessions		

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Thursday 29 July (BST)



Time	Session		
13:30	Welcome and announcements		
13:35	<p>Best of Young presentations Session chair: Brian McCarthy</p> <p>Revisiting amorphous molybdenum sulfide for the electro-driven reduction of N₂ and N-containing nitrogenases substrates Kun Yang <i>University of Grenoble Alpes, France</i></p> <p>An open database for the visualisation and meta-analysis of experimentally demonstrated solar photo-electrochemical hydrogen production devices Isaac Holmes-Gentle <i>École Polytechnique Fédérale de Lausanne, Switzerland</i></p>		
13:55	<p>Multi-electron/multi-proton catalysis (homogeneous, heterogeneous, enzymatic and bioinspired processes) Chair: Johannes Messinger</p> <p>Flash poster presentations (4 minutes)</p> <p>The alternative catalytic cycle of [FeFe] hydrogenases: Much SO₂ about nothing Maria Alessandra Martini <i>Max Planck Institute for Chemical Energy Conversion, Germany</i></p> <p>The catalytic proton transfer pathway of [FeFe]-Hydrogenase Moritz Senger <i>Uppsala University, Sweden</i></p>	<p>Light-harvesting and light-driven processes Chair: Starla Glover</p> <p>Flash poster presentations (4 minutes)</p> <p>2D HYSCORE and DFT studies of one-electron–two-proton transfer in a bioinspired artificial photosynthetic reaction center Dalvin Mendez <i>University of Puerto Rico at Cayey, USA</i></p> <p>Accumulated and long-lived charge in SrTiO₃-based photocatalyst sheets: origins and role in water splitting activity</p>	<p>Devices and demonstration: robustness, sustainability and upscale Chair: Vincent Artero</p> <p>Flash poster presentations (4 minutes)</p> <p>HyBioSol: Hybrid bio-solar reactors for CO₂ recycling Paolo Dessi <i>National University of Ireland Galway, Ireland</i></p> <p>Nanoporous Au and Cu gas diffusion electrodes for selective, high current density carbon dioxide reduction Aiden Fenwick <i>Caltech, USA</i></p>

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	<p>Electrocatalytic reaction kinetics information from potential/time resolved XAS data. Case study: Ni-Fe oxide-hydroxide catalysed OER Luca D'Amario <i>Uppsala University, Sweden</i></p> <p>Operando spectroelectrochemical analysis of active state kinetics in water-oxidation IrOx and iridium-based molecular electrocatalysts Carlota Bozal-Ginesta <i>Imperial College London, UK</i></p> <p>Molecular-engineered electrodes incorporating novel derivatives of a hydrogen-evolving cobalt macrocyclic complex Andrew Bagnall <i>Uppsala University, Sweden</i></p> <p>A small organic catalyst based on Benzothiadiazole for electrocatalytic hydrogen production Martin Axelsson <i>Uppsala University, Sweden</i></p>	<p>Anna Wilson <i>Imperial College London, United Kingdom</i></p> <p>Photocatalytic hydrogen production of self-assembled Porphyrin-Dipeptide hybrids Emmanouil Nikoloudakis <i>University of Crete, Greece</i></p> <p>Visible light driven CO₂ reduction by cobalt phthalocyanine-based hybrid materials Souvik Roy <i>University of Lincoln, UK</i></p> <p>Organic triplet photosensitizers for CO₂ reduction Elena Bassan <i>University of Bologna, Italy</i></p> <p>Photocatalytic Carbon Dioxide Reduction in Metal-organic Frameworks based on Organic Dyes Johanna Haimerl <i>University of Munich, Germany</i></p>	<p>Protocols for assessing the PEC stability & performance of BiVO₄ photoanodes with Fe(Ni)OOH OER catalysts under water splitting conditions Ibbi Ahmet <i>Helmholtz Zentrum Berlin, Germany</i></p> <p>A route to sustainable chemical synthesis using heterogenized photoredox catalysts Kelly Materna <i>Uppsala University, Sweden</i></p> <p>Rational design of photoelectrochemical perovskite-BiVO₄ tandem devices for selective syngas production Virgil Andrei <i>University of Cambridge, UK</i></p>
14:25	Poster Session		
15:30	<p>Break “Meet the editor” networking room open</p>		

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Parallel subject sessions			
	Topic 4 – Multi-electron/multi-proton catalysis (homogeneous, heterogeneous, enzymatic and bioinspired processes) Session Chair: Clifford Kubiak <i>University of California, San Diego, USA</i>	Topic 5 – Light-harvesting and light-driven processes Session Chair: Michael Wasielewski <i>Northwestern University, USA</i>	Topic 6 – Devices and demonstration: robustness, sustainability and upscale Session Chair: Marcella Bonchio <i>University of Padova, Italy</i>
16:00	Keynote lecture: Water Oxidation Reaction in Natural Photosynthesis Junko Yano <i>Lawrence Berkeley National Laboratory, USA</i>	Keynote lecture: Metal oxide nanosheets as building blocks for photo-induced water splitting systems Kazuhiko Maeda <i>Tokyo Institute of Technology, Japan</i>	Keynote lecture: Multi-scale modeling and investigation of robust photoelectrodes and competitive PEC devices Sophia Haussener <i>EPFL, Switzerland</i>
16:30	Structural insights on the mechanism of the electron-bifurcating [FeFe] hydrogenase from Thermotoga maritima James Birrell <i>Max Planck Institute for Chemical Energy Conversion, Germany</i>	Structure-activity relationship in heptacoordinate cobalt complexes for light-driven hydrogen evolution: place matters! Albert Ruggi <i>Université de Fribourg, Switzerland</i>	Quantifying heat transfer in a thermally integrated photovoltaic-electrolyser Erno Kemppainen <i>Helmholtz-Zentrum Berlin, Germany</i>
16:40	Studying the mechanisms of molecular electrocatalysis for carbon dioxide reduction Alexander Cowan <i>University of Liverpool, United Kingdom</i>	Studies on multielectron oxygen-reduction mechanism of platinum-loaded tungsten(VI)-oxide photocatalysts based on light intensity-dependence analysis Mai Takashima <i>Hokkaido University, Japan</i>	Innovative design of photoelectrochemical cells for water splitting: scale-up through numbering-up and integration into a panel Roberto Gómez <i>Universitat d'Alacant, Spain</i>

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16:50	Integrating Molecular Catalysts with Semiconductor Light Absorbers for Solar Fuel Production Jillian Dempsey <i>University of North Carolina, USA</i>	Transient Absorption Microscopy of Carbon Nitride Photocatalysts on Timescales of Chemical Reactions Robert Godin <i>The University of British Columbia, Canada</i>	Porous photoelectrodes for scalable photoelectrochemical H₂ production Hannah Johnson <i>Toyota Motor Europe, Belgium</i>
17:00	Break “Meet the editor” networking room open		
17:30	Q&A / Discussion <i>Session chair: Eric Marechal, Leif Hammarström</i> ALGATEC Eco Business Park: Towards Europe’s largest microalgae production and biorefining units for products and fuels in integration with an industrial plant Tiago Guerra, A4F- Algae for future, Portugal Bulk heterojunction polymer photoelectrodes for solar water splitting Kevin Sivula, EPFL, Switzerland Solar-Driven Water Splitting (opening plenary) Harry Gray, Caltech, USA <i>All plenary talks will be available to view for 1 week prior to the conference, and we encourage attendees to submit any questions prior to this discussion session. Information on viewing these sessions will be shared with registered attendees closer to the conference date.</i>		
18:00	Closing remarks and poster prize presentation		
18:10	Close of conference		