

# Welcome to the World Fuel Cell Conference 2023

**MSRH = Molecular Sciences Research Hub**  
**UREN = Sir Michael Uren Hub**

This conference is held in the Department of Chemistry, Imperial College London.

**Sunday 10<sup>th</sup> December 2023** = Conference Workshop  
**Monday 11<sup>th</sup> – Wednesday 13<sup>th</sup> December** = Conference Proceedings  
**Monday 11<sup>th</sup> December (evening)** = Conference Dinner

This conference consists of a host of Plenary and Keynote presentations, amongst talks given by your fellow attendees, spanning a wide range of topics in Hydrogen, Fuel Cells, and related technologies.

Conference registration will be outside the 'Common Room' (just inside the building entrance) and will be available throughout the day. You will be provided with a lanyard on your first day, however we kindly ask that you please continue to register each day, upon arrival.

**Plenary Talks and Panel Discussions and the 3MT will be held in the 'Lecture Theatre' (B10, MSRH).**

**Lunch, Coffee Breaks, and the Morning Reception will be held in the 'Common Room' (G19, MSRH).**

Due to the number of interesting talks submitted this year, we will often be running parallel sessions. These have been split between two presentation spaces within the building:

**'Lecture Theatre' (B10, MSRH)**

**'Seminar Room' (G23, MSRH)**

**The Conference Dinner will be held in 'The Works' (Ground Floor, UREN).**

**Please see the following programme for more detailed timings and further information.**

If you have any questions, please feel free to approach any of the conference organisers or local attendees. We will be identifiable by our green conference lanyards and are more than happy to help.

We sincerely hope you enjoy the conference and the many presentations on offer.

*- Local Organising Committee WFCC2023*

Sunday 10<sup>th</sup> December 2023

13:00-17:00 **Registration and Reception** (*Common Room*)

**Conference Workshop**

14:00

(*Common Room*)

14:00-14:50

**Tutorial 1: Electrochemical impedance spectroscopy tutorial**

**Jianbo Zhang**

Tsinghua University, China

15:00-15:50

**Tutorial 2: Fuel cell and electrolyser materials characterisation and testing tutorial**

**Adam Holland**

Horiba UK

16:00-16:50

**Tutorial 3: High mass-transport electrochemical testing of catalysts for fuel cells, electrolysers and related devices**

**Xiaoqian Lin, Michalis Metaxas**

Imperial College London, UK

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**The Works, UREN**  
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# Monday 11<sup>th</sup> December 2023

08:30-09:30 **Registration and Reception** (*Common Room*)

09.30	(Lecture Theatre)	
09:30-10:00	<b>Opening ceremony</b>	
10:00-10:45	<b>Plenary 1: New material challenges for polymer electrolyte fuel cells in heavy-duty transportation</b> <u><b>Katsuyoshi Kakinuma</b></u> University of Yamanashi, Japan <span style="float: right;"><b>Session Chair:</b> Shangfeng Du</span>	
10:45-11:15	<b>Coffee break</b> ( <i>Common Room</i> )	
11:15-12:00	<b>Plenary 2: Modelling for fuel cell transport phenomena and design</b> <u><b>Kui Jiao</b></u> Tianjin University, China <span style="float: right;"><b>Session Chair:</b> Anthony Kucernak</span>	
12:00-12:45	<b>Plenary 3: Ceres technology for clean power and green hydrogen</b> <u><b>Subhashish Mukerjee</b></u> Ceres Power Limited, UK <span style="float: right;"><b>Session Chair:</b> Anthony Kucernak</span>	
12:45-14:15	<b>Lunch (&amp; poster presentation)</b> ( <i>Common Room</i> )	
14:15	A01: Hydrogen Integration I (Lecture Theatre) Session Chairs: Martin Freer, Subhashish Mukerjee	B01: PEMFC Components I (Seminar Room) Session Chairs: Stefania Specchia, Alex Martinez
14:15-14:45	<b>Keynote 1: Hydrogen in the Midlands</b> <u><b>Martin Freer</b></u> University of Birmingham, UK	<b>Keynote 2: The use of waste biomass in the synthesis of platinum-free sustainable electrocatalysts</b> <u><b>Stefania Specchia</b></u> Politecnico di Torino, Italy
14:45-15:00	<b>A0101: The carbon footprint of green hydrogen – a case study for Italy and the UK</b> <u><b>Mehrshad Kolahchian Tabrizi</b></u> , <i>Jacopo Famiglietti, Davide Bonalumi, Stefano Campanari</i> Politecnico di Milano, Italy	<b>B0101: Oxygen transport mechanism and structure optimization for cathode catalyst layer of PEMFC</b> <u><b>Xiaojing Cheng</b></u> , <i>Shuiyun Shen, Junliang Zhang</i> Shanghai Jiao Tong University, China
15:00-15:15	<b>A0102: Sustainable hydrogen production from offshore wind</b> <u><b>Alejandra Hormaza Mejia</b></u> <sup>(1)</sup> , <i>Jack Brouwer</i> <sup>(2)</sup> (1) California Polytechnic State University, USA; (2) University of California, USA	<b>B0102: Optimization of critical parameters for inkjet-printed electrodes in proton exchange membrane fuel cells</b> <u><b>Qingying Zhao</b></u> <sup>(1,2)</sup> , <i>Tobias Morawietz</i> <sup>(1)</sup> , <i>Sanchez Monreal Juan</i> <sup>(1)</sup> , <i>Pawel Gazdzicki</i> <sup>(1)</sup> , <i>K. Andreas Friedrich</i> <sup>(1,2)</sup> (1) Germany Aerospace Centre (DLR), Germany; (2) University of Stuttgart, Germany

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15:15-15:30	<b>A0103: Optimal sizing and scheduling of hydrogen-electricity hybrid energy storage system</b> <u>Yangwanqing Yu</u> , Biao Liu, Fuyuan Yang, Minggao Ouyang Tsinghua University, China	<b>B0103: High oxygen transport electrode design with long-term stability for high-power and low Pt-loaded proton exchange membrane fuel cells</b> <u>Huiyuan Li</u> , Xiaojing Cheng, Shu Yuan, Jiabin You, Xiaohui Yan, Shuiyun Shen, Junliang Zhang Shanghai Jiao Tong University, China
15:30-15:45	<b>A0104: Revealing hydrogen's complementary role to batteries for energy storage</b> <u>XiaoYu Wu</u> , Michael Anthony Giovanniello, Aamer Akhand University of Waterloo, Canada	<b>B0104: Reaching high loading of atomic iron in Fe-N/C oxygen reduction catalysts for proton exchange membrane fuel cells</b> <u>Mengjun Gong</u> <sup>(1)</sup> , Asad Mehmood <sup>(2)</sup> , Anthony Kucernak <sup>(1)</sup> (1) Imperial College London, UK; (2) Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
15:45-16:00	<b>A0105: Modelling and optimising liquid hydrogen transfer processes</b> <u>Albert Gil Esmendia</u> , Robert J Flores, Jack Brouwer University of California, USA	<b>B0105: The curse of poly(acrylic acid) on the proton conductivity in electrospun catalyst layers</b> <u>Yiming Zhang</u> <sup>(1)</sup> , Caihan Zhub <sup>(2)</sup> , Yong Liu <sup>(2)</sup> , Jianbo Zhanga <sup>(1)</sup> (1) Tsinghua University, China; (2) Beijing University of Chemical Technology, China
16:00-16:15	<b>A0106: Integrating hydrogen into the energy system: does it need to be hydrogen?</b> <u>Robert Steinberger-Wilckens</u> University of Birmingham, UK	<b>B0106: Nanoflower-branch LDHs and CoNi alloy derived from electrospun carbon nanofibers for efficient oxygen electrocatalysis in microbial fuel cells</b> <u>Huiyu Li</u> <sup>(1,2)</sup> , Congju Li <sup>(1)</sup> , Shangfeng Du <sup>(2)</sup> (1) University of Science and Technology Beijing, China; (2) University of Birmingham, UK
16:15-16:45	<b>Coffee break</b> ( <i>Common Room</i> )	
<b>16.45</b>	<i>(Lecture Theatre)</i>	
16:45-17:15	<b>Keynote 3: Hydrogen fuel cell &amp; electrolyser testing capability</b> <u>Lewis George</u> Horiba UK	<b>Session Chair:</b> Robert Steinberger-Wilckens
17:15-18:00	<b>Panel Discussion I: Hydrogen landscape and applications</b>	<b>Session Chair:</b> Martin Freer <b>Panel:</b> Tony Duan, Mikhail Girinovich Alex Martinez Subhasish Mukerjee

**18:30-22:30** **Conference Dinner** (*The Works*)

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Tuesday 12 December 2023

8:30-9:00 **Registration and Reception** (*Common Room*)

09.00	<i>(Lecture Theatre)</i>	
9:00-9:45	<b>Plenary 4: Design of Bipolar Plate and Flow Field for PEM Fuel Cells</b> <u><b>Xianguo Li</b></u> University of Waterloo, Canada <span style="float: right;"><b>Session Chair:</b> Shangfeng Du</span>	
09:45	<b>A02: PEMFC Operation</b> ( <i>Lecture Theatre</i> ) <b>Session Chairs:</b> Wenfeng Lin, Guanjie He	<b>B02: PEMFC Components II</b> ( <i>Seminar Room</i> ) <b>Session Chairs:</b> Tom S. Miller, Lin Zeng
9:45-10:15	<b>Keynote 4: Some developments and results to better understand transfers in PEMFCs and improve their performance</b> <u><b>Joel Pauchet</b></u> CEA, France	<b>B0201: Tuning the membrane electrode assembly for high-performance proton exchange membrane fuel cells</b> <u><b>Tom S. Miller</b></u> University College London, UK  <b>B0202: Enhancing anode reversal tolerance by low-carbon and carbon-free anode catalyst layers for proton exchange membrane fuel cells</b> <i>Li Zheng<sup>(1,2)</sup>, Haodong Huang<sup>(2)</sup>, Cailin Xiao<sup>(2)</sup>, Zijie Zhang<sup>(2)</sup>, Tianshou Zhao<sup>(2)</sup>, <u><b>Lin Zeng</b></u><sup>(2)</sup></i> (1) The Hong Kong University of Science and Technology, China; (2) Southern University of Science and Technology, China
10:15-10:30	<b>A0201: Mitigation strategy of tempo redox mediator crossover in chemically regenerative fuel cells</b> <u><b>Pierre-Yves Blanchard</b></u> , Remi Bacabe, Sara Cavaliere, Deborah Jones, Jacques Roziere, Nicolas Donzel, Marc Dupont, Frédéric Lecoeur, Claude Niebel University of Montpellier, France	<b>B0203: Surfactant doped polyaniline coatings for functionalised gas diffusion layers in low and high temperature polymer electrolyte fuel cells</b> <u><b>Florian Tritscher</b></u> , Fabio Blaschke, Alexander Pranter, Eduardo Machado-Charry, Merit Bodner Graz University of Technology, Austria
10:30-10:45	<b>A0202: Mechanism of platinum surface ice nucleation during low-temperature startup of PEM fuel cell: interplay between surface morphology and hydrophobicity</b> <u><b>Jiaqi Wang</b></u> , Linhao Fan, Lincai Li, Qing Du, Kui Jiao Tianjin University, China	<b>B0204: The rational design of anode towards high current density low Pt loading PEMFCs</b> <u><b>Kai Niu</b></u> <sup>(1)</sup> , Dewei Li <sup>(1)</sup> , Yunan Wang <sup>(2)</sup> , Jianbo Zhang <sup>(1)</sup> (1) Tsinghua University, China; (2) The Ningbo Institute of Industrial Technology (CNITECH) of the Chinese Academy of Sciences (CAS), China
10:45-11:00	<b>A0203: Pore-scale investigation of micro-patterned membrane based on lattice Boltzmann method in PEMFCs</b> <u><b>Yuan Wang</b></u> , Xing Li, Linhao Fan, Qing Du, Kui Jiao Tianjin University, China	<b>B0205: Elucidating gas diffusion layer degradation in polymer electrolyte fuel cells under different oxidative media</b> <u><b>Joel Mata Edjokola</b></u> , Viktor Hacker, Merit Bodner Graz University of Technology, Austria

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11:00-11:15	<p><b>A0204: Enhancing proton exchange membrane fuel cell performance via vertical gas supply and constructing a patterned hydrophobic catalyst layer</b></p> <p><i>Yan Zhang, <b>Jinzhan Su</b>, Liejin Guo</i> Xi'an Jiaotong University, China</p>	<p><b>B0206: Preparation of high performance, ultra-low loading catalyst layers for PEM fuel cells</b></p> <p><i><b>Michalis Metaxas</b>, Colleen Jackson, Jack Dawson, Anthony R. Kucernak</i> Imperial College London, UK</p>
11:15-11:45	<b>Coffee break (Common Room)</b>	
<b>11:45</b>	<p><b>A02: PEMFC Operation (Lecture Theatre)</b></p> <p>Session Chairs: Pierre-Yves Blanchard, Chengge Jiao</p>	<p><b>B03: Fuel Cell and Electrolyser Characterisation I (Seminar Room)</b></p> <p>Session Chairs: Merit Bodner, Jennifer Hack</p>
11:45-12:00	<p><b>A0205: Advanced online water management strategies for fuel cell stack in vehicle powertrain control</b></p> <p><i><b>Yu Duan</b><sup>(1)</sup>, Yu Li<sup>(2)</sup>, Daniel To<sup>(1)</sup>, Jiaxiang Zhang<sup>(1)</sup>, Jinrui Chen<sup>(2)</sup></i> (1) Changan UK R&amp;D Centre Ltd, UK; (2) Changan Deepal Technical Co., Ltd, China</p>	<p><b>B0301: Photometric fluoride emission analysis for the effluent water of polymer electrolyte fuel cells</b></p> <p><i><b>Merit Bodner</b><sup>(1)</sup>, Mathias Heidinger<sup>(1)</sup>, Eveline Kuhnert<sup>(1)</sup>, Kurt Mayer<sup>(1)</sup>, Daniel Sandu<sup>(2)</sup>, Viktor Hacker<sup>(1)</sup></i> (1) Graz University of Technology, Austria; (2) AiDEXA GmbH, Austria</p>
12:00-12:15	<p><b>A0206: Water recovery from PEMFC emission: output performance and water recovery efficiency</b></p> <p><i><b>Jing Yao</b>, Yuchen Yang, Zhen Wu, Fusheng Yang, Zaoxiao Zhang</i> Xi'an Jiaotong University, China</p>	<p><b>B0302: Visualising water evolution in fuel cell flow fields with high-speed neutron tomography</b></p> <p><i><b>Jennifer Hack</b><sup>(1,2,3)</sup>, Ralf F. Ziesche<sup>(4)</sup>, Lara Rasha<sup>(2)</sup>, Matilda Fransson<sup>(2,5)</sup>, Theo Suter<sup>(2)</sup>, Lukas Helfen<sup>(6)</sup>, Cyrille Couture<sup>(6)</sup>, Nikolay Kardjilov<sup>(4)</sup>, Alessandro Tengattini<sup>(6)</sup>, Paul Shearing<sup>(2,3,7)</sup>, Dan Brett<sup>(2)</sup></i> (1) University of Sheffield, UK; (2) University College London, UK; (3) The Faraday Institution, UK; (4) Helmholtz-Zentrum Berlin für Materialien und Energie (HZB), Germany; (5) European Synchrotron Radiation Facility (ESRF), France; (6) Institut Laue-Langevin, France; (7) University of Oxford, UK</p>
12:15-12:30	<p><b>A0207: Investigating the impact of hexagon-pin flow field design on PEMFC water management</b></p> <p><i>Duy Khang Dang, <b>Biao Zhou</b></i> University of Windsor, Canada</p>	<p><b>B0303: In-situ visualisation and performance analysis of proton exchange membrane fuel cell with different flow channels</b></p> <p><i><b>Zhengguo Qin</b>, Chasen Tongsh, Zhiming Bao, Qing Du, Kui Jiao</i> Tianjin University, China</p>
12:30-12:45	<p><b>A0208: Effect of liquid saturation transients on electrochemical impedance of PEM fuel cell</b></p> <p><i><b>Ying Sun</b><sup>(1,2)</sup>, Michael Eikerling<sup>(1,3)</sup>, Andrei Kulikovskiy<sup>(1)</sup>, Thomas Kadyk<sup>(1,2,3)</sup></i> (1) Forschungszentrum Jülich GmbH, Germany; (2) RWTH Aachen University, Germany; (3) JARA Energy, Germany</p>	<p><b>B0304: NiCr/NiSi thin film thermocouple sensor was developed for internal temperature measurement of proton exchange membrane fuel cell gas channel</b></p> <p><i><b>Zhihui Liu</b><sup>(1)</sup>, Yumeng Yang<sup>(2)</sup>, Zixi Wang<sup>(1)</sup></i> (1) Tsinghua University, China; (2) Suzhou University of Science and Technology, China</p>
12:45-14:15	<b>Lunch (&amp; poster presentation) (Common Room)</b>	

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14:15	<b>A03: Hydrogen Integration II (Lecture Theatre)</b> Session Chairs: Sara Walker, Tony Duan	<b>B04: Fuel Cell and Electrolyser Characterisation II (Seminar Room)</b> Session Chairs: Chengge Jiao, Jack Armitage
14:15-14:45	<b>Keynote 5: Hydrogen integration into energy systems: the glue for net zero</b> <u>Sara Walker</u> Newcastle University, UK	<b>B0401: Advancing sustainable fuel cell technologies through Verder Scientific's scientific assisting processing and analytical equipment</b> <u>Jack Armitage</u> Verder Scientific, UK  <b>B0402: Innovative method for assessing PEM fuel cell or electrolyser degradation: utilizing SEM EDS PCA phase analysis on porous transfer layers</b> <u>Chengge Jiao</u> <sup>(1)</sup> , Richard White <sup>(1)</sup> , Shangfeng Du <sup>(2)</sup> (1) Thermo Fisher Scientific, The Netherlands; (2) University of Birmingham, UK
14:45-15:00	<b>A0301: Development of 350bar hydrogen charging protocol optimization for heavy duty commercial vehicles</b> <u>Taebeen Kim</u> <sup>(1)</sup> , Siwoong Kim <sup>(2)</sup> , Seunghun Oh <sup>(2)</sup> , Jongyun Jung <sup>(2)</sup> , Sanggyu Kang <sup>(1,2)</sup> (1) Research Institute of Marine System Engineering, Republic of Korea; (2) Seoul National University, Republic of Korea	<b>B0403: Towards the surface mass transport at gas/ionomer/catalyst interfaces: the floating electrode approach</b> <u>Xiaoqian Lin</u> <sup>(1)</sup> , Colleen Jackson <sup>(2)</sup> , Mingyu Xia <sup>(3)</sup> , Chris Zaltis <sup>(2)</sup> , Alex Martinez Bonastre <sup>(2)</sup> , Anthony Kucernak <sup>(1)</sup> (1) Imperial College London, UK; (2) Johnson Matthey Technical Centre, United Kingdom; (3) The University of Hong Kong, China
15:00-15:15	<b>A0302: Liquefied hydrogen storage material and design of liquefied hydrogen carrier ships</b> <u>Pramod Kumar Mallya</u> FLOATSYS, USA	<b>B0404: Fluoride emission rate analysis in proton exchange membrane water electrolysis cells</b> <u>Eveline Kuhnert</u> , Mathias Heidinger, Viktor Hacker, Merit Bodner Graz University of Technology, Austria
15:15-15:30	<b>A0303: Initial design of fuel cell propulsion system retrofit for aircraft with battery assisted takeoff</b> <u>Geoffrey J Liu</u> <sup>(1)</sup> , Nisha Jeyaganeshan <sup>(1)</sup> , Kelly Chow <sup>(1)</sup> , Shaella Suherli <sup>(1)</sup> , Yao Yu <sup>(1)</sup> , Xianguo Li <sup>(1)</sup> , Alexander Crain <sup>(2)</sup> , Patrick Zdunich <sup>(2)</sup> (1) University of Waterloo, Canada; (2) National Research Council of Canada, Canada	<b>B0405: The H<sub>2</sub>-X rechargeable fuel cells from the molecular to device level</b> <u>Christopher G. Cannon</u> <sup>(1)</sup> , Peter A. A. Klusener <sup>(2)</sup> , Nigel P. Brandon <sup>(1)</sup> , Anthony R. J. Kucernak <sup>(1)</sup> (1) Imperial College London, UK; (2) Shell Global Solutions International B.V., The Netherlands
15:30-16:00	<b>Coffee break (Common Room)</b>	
16.00	<b>(Lecture Theatre)</b>	
16:00-16:45	<b>Panel Discussion II: Technical challenges for the implementation of hydrogen technology</b> Session Chair: Xianguo Li Panel: Kui Jiao, Katsuyoshi Kakinuma, Sara Walker, Jianbo Zhang	
16:45-18:00	<b>3MT</b> Session Chair: Jianbo Zhang Panel: Merit Bodner, Katsuyoshi Kakinuma, Sara Walker	

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Wednesday 13 December 2023

08:30-09:00 **Registration and Reception** (Common Room)

09.00		(Lecture Theatre)	
09:00-09:45	<p><b>Plenary 5: Robust CCM technology for automotive application</b>  <u>Alex Martinez</u>                      Johnson Matthey, UK</p>	Session Chair: Anthony Kucernak	
09:45		A04: PEMFC Components III (Lecture Theatre) Session Chairs: Yunan Wang, Pierre-Yves Blanchard	B05: Fuel Cell Modelling (Seminar Room) Session Chairs: Kui Jiao, John Varcoe
09:45-10:15	<p><b>Keynote 6: Performance and durability of PEMFC catalysts based on accessible carbon supports</b>  <u>Yunan Wang</u>                      Ningbo Institute of Materials Technology and Engineering CAS, China</p>	<p><b>B0501: Modelling recoverable performance loss of proton exchange membrane fuel cells</b>  <u>Yuwei Pan</u>, Huizhi Wang, Nigel P. Brandon                      Imperial College London, UK</p>	<p><b>B0502: PEMFC durability analysis combined with membrane and Pt catalyst degradation models: based on real vehicle data</b>  <u>Zhina Wang</u>, Hui Tao, Weibo Zheng, Liangfei Xu, Jianqiu Li, Minggao Ouyang                      Tsinghua University, China</p>
10:15-10:30	<p><b>A0401: PVD coatings for lightweight PEMFC bipolar plates</b>  <u>Parnia Navabpour</u><sup>(1)</sup>, Liam Cooper<sup>(2)</sup>, Jinlong Yin<sup>(1)</sup>, Kun Zhang<sup>(2)</sup>, Ahmad El Kharouf<sup>(2)</sup>                      (1) Teer Coatings Limited, UK; (2) University of Birmingham, UK</p>	<p><b>B0503: Bridging microstructure degradation and macroscopic performance modelling in polymer electrolyte fuel cell catalyst layers</b>  <u>Thomas Kadyk</u><sup>(1)</sup>, Wolfgang Olbrich<sup>(1,2,3)</sup>, David Bernhard<sup>(3,4)</sup>, Sebastian Kirsch<sup>(3)</sup>, Ulrike Krewer<sup>(4)</sup>, Michael Eikerling<sup>(1,2)</sup>                      (1) Forschungszentrum Jülich GmbH, Germany; (2) RWTH Aachen University, Germany; (3) Robert Bosch GmbH, Germany; (4) Volkswagen AG, Germany; (5) Karlsruhe Institute of Technology, Germany</p>	
10:30-10:45	<p><b>A0402: Rational design of ionomer on high-surface-area carbon supports for boosting oxygen and proton transport into micropores in proton exchange membrane fuel cells</b>  <u>Jiabin You</u>, Huiyuan Li, Xiaojing Cheng, Xiaohui Yan, Shuiyun Shen, Junliang Zhang                      Shanghai Jiao Tong University, China</p>	<p><b>B0504: Digitally-assisted structure design of commercial proton exchange membrane fuel cell</b>  <u>Wenming Huo</u><sup>(1)</sup>, Biao Xie<sup>(1)</sup>, Benbouzid Mohamed<sup>(2)</sup>, Fei Gao<sup>(3)</sup>, Yassine Amirat<sup>(4)</sup>, Linhao Fan<sup>(1)</sup>, Zhiming Bao<sup>(1)</sup>, Kui Jiao<sup>(1)</sup>                      (1) Tianjin University, China; (2) University of Brest, France; (3) Université de Technologie de Belfort-Montbéliard, France; (4) L@bISEN, France</p>	
10:45-11:00	<p><b>A0403: High-performance and durable 3D ordered Pt nanowire array electrodes for PEMFCs</b>  <u>Yichang Yan</u><sup>(1)</sup>, Yang Li<sup>(1)</sup>, Ming-Shui Yao<sup>(2)</sup>, Chengge Jiao<sup>(3)</sup>, Shangfeng Du<sup>(1)</sup>                      (1) University of Birmingham, UK; (2) The Chinese Academy of Sciences, China (3) Thermo Fisher Scientific, The Netherlands</p>	<p><b>B0505: A model-based decoupling control of proton-exchange membrane air system with expander</b>  <u>Hui Tao</u>, Liangfei Xu, Zunyan Hu, Jianqiu Li, Minggao Ouyang                      Tsinghua university, China</p>	

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11:00-11:30	<b>Coffee break</b> ( <i>Common Room</i> )	
<b>11:30</b>	<b>A05: Water Electrolysis I</b> ( <i>Lecture Theatre</i> ) Session Chairs: Jianbo Zhang, Katsuyoshi Kakinuma	<b>B06: SOFC I</b> ( <i>Seminar Room</i> ) Session Chair: Parnia Navabpour, Alessandro Donazzi
11:30- 11:45	<b>A0501: Electrode design for seawater electrolyser based on supraerophobic Nickel-based catalyst</b> <u>Yang Li</u> , Wen-Feng Lin Loughborough University, UK	<b>B0601: Potential and techno-economic perspectives of the Solid Oxide Semi-closed CO<sub>2</sub> cycle (SOS-CO<sub>2</sub>) for power generation with near zero CO<sub>2</sub> emissions</b> Matteo Martinelli, Roberto Scaccabarozzi, Manuele Gatti, Alessandro Donazzi, Emanuele Martelli, <u>Stefano Campanari</u> Politecnico di Milano, Italy
11:45-12:00	<b>A0502: Phosphidation of cobalt iron oxide nanoparticles decorated nitrogen-doped graphene for efficient and stable electrocatalytic water splitting</b> Sana Ullah <sup>(1)</sup> , Asif Hussain <sup>(2)</sup> , Muhammad Asim Farid <sup>(3)</sup> , Shangfeng Du <sup>(4)</sup> , Mohammad Alam Saeed <sup>(3)</sup> , Ji-jun Zou <sup>(1)</sup> , <u>Muhammad Tahir</u> <sup>(4)</sup> (1) Tianjin University, China; (2) University of Lahore, Pakistan; (3) University of Education, Pakistan; (4) University of Birmingham, UK	<b>B0602: Kinetic and durability effects of CO<sub>2</sub>-rich mixtures on state of the art SOFC cathodes</b> Michele Pagliari, Martina Marasi, Stefano Campanari, Emanuele Martelli, <u>Alessandro Donazzi</u> Politecnico di Milano, Italy
12:00-12:15	<b>A0503: Universal synthesis of high-density ultrasmall Fe-Ru nanoparticles on nickel mesh by one-step replacement reaction for boosting alkaline water electrolysis</b> <u>Junyu Zhang</u> , Fuyuan Yang, Minggao Ouyang Tsinghua University, China	<b>B0603: Modelling study on the interactions among various working parameters on the protonic ceramic electrolyser</b> <u>Zheng Li</u> , Meng Ni The Hong Kong Polytechnic University, China
12:15-12:30	<b>A0504: Benchmark iridium-based catalysts for oxygen evolution reaction in proton exchange membrane water electrolyzers</b> <u>Dehua Hou</u> , Shangfeng Du University of Birmingham, UK	<b>B0604: Modelling and validation of solid oxide fuel cell performance for integrated power-to-gas and decarbonisation system</b> <u>Kazeem Ayodeji Mohammed</u> <sup>(1)</sup> , Amirpiran Amiri <sup>(2)</sup> , Robert Steinberger-Wilckens <sup>(1)</sup> (1) University of Birmingham, UK; (2) Aston University, United Kingdom
12:30-12:45	<b>A0505: Enhancement of oxygen evolution activity on iridium oxide nanorod catalyst supported on Sb-doped SnO<sub>2</sub></b> <u>Guoyu Shi</u> <sup>(1)</sup> , Tetsuro Tano <sup>(1)</sup> , Donald A. Tryk <sup>(1)</sup> , Tomoki Uchiyama <sup>(2)</sup> , Akihiro Liyama <sup>(1)</sup> , Makoto Uchida <sup>(1)</sup> , Yoshiharu Uchimoto <sup>(2)</sup> , Katsuyoshi Kakinuma <sup>(1)</sup> (1) University of Yamanashi, Japan; (2) Kyoto University, Japan	<b>B0605: Effect of temperature and water content on the oxidation behaviour and Cr evaporation of high-Cr alloys for SOFC cathode air preheaters</b> <u>Kun Zhang</u> <sup>(1)</sup> , Ahmad El-kharouf <sup>(2)</sup> , Robert Steinberger-Wilckens <sup>(1)</sup> (1) University of Birmingham, UK; (2) Arup, UK
12:45-14:15	<b>Lunch (&amp; poster presentation)</b> ( <i>Common Room</i> )	

Lecture Theatre - B10, MSRH  
(Floor: Basement, -2)

Seminar Room - G23, MSRH  
(Floor: Ground, 0)

Common Room - G19, MSRH  
(Floor: Ground, 0)

The Works, UREN  
(Floor: Ground, 0)

14:15	<b>A06: Water electrolysis II (Lecture Theatre)</b> Session Chairs: Geng Qiao, Jaroslaw Milewski	<b>B07: SOFC II (Seminar Room)</b> Session Chair: XiaoYu Wu
14:15-14:30	<b>A0601: Experimental investigation of molten carbonate electrolysis under changing thermal-flow conditions</b> <i>Aliaksandr Martsinchyk<sup>(1)</sup>, <u>Jaroslaw Milewski<sup>(1)</sup></u>, Arkadiusz Szczęśniak<sup>(1)</sup>, Giovanni Cinti<sup>(2)</sup>, Olaf Dybiński<sup>(1)</sup></i> (1) Warsaw University of Technology, Poland; (2) University of Perugia, Italy	<b>B0701: Boosting the electrochemical performance of oxygen electrodes via formation of LSCF-BCM<sub>x</sub>Y composite for the solid oxide fuel cells: Part II</b> <u>Muhammad Bilal Hanif<sup>(1)</sup></u> , Amir Sultan <sup>(2)</sup> , Michał Mosiałek <sup>(2)</sup> , Martin Motola <sup>(1)</sup> (1) Comenius University Bratislava, Slovakia; (2) Polish Academy of Sciences, Poland
14:30-14:45	<b>A0602: Operating boundaries for the mitigation of SO<sub>2</sub> crossover in sulphur depolarised electrolyser cells</b> <u>Lukas Roessler Escudero</u> , Viktor Hacker, Merit Bodner Graz University of Technology, Austria	<b>B0702: Enhancing the performance of Ni<sub>0.8</sub>Co<sub>0.15</sub>Al<sub>0.05</sub>Li electrode by inserting Sm<sub>2</sub>Ba<sub>1.33</sub>Ce<sub>0.67</sub>Cu<sub>3</sub>O<sub>9</sub> electrode for semiconductor-based fuel cells</b> <u>Muhammad Ali Khalid<sup>(1)</sup></u> , Jianbing Huang <sup>(1)</sup> , Muhammad Bilal Hanif <sup>(2)</sup> , Liejin Guo <sup>(1)</sup> (1) Xi'an Jiaotong University, China; (2) Comenius University Bratislava, Slovakia
14:45-15:00	<b>A0603: Fluid dynamics of flow through membraneless electrolysis</b> <u>Daniel Niblett</u> , Hosni Elwan, Mohamed Mamlouk Newcastle University, UK	<b>B0703: From fundamental science to economic success - Frontiers for World Fuel Cell Conference 2023</b> <u>Hashini Thirimanne, PhD</u> Frontiers in Energy Research, Frontiers Media, UK
15.00	<b>(Lecture Theatre)</b>	
15:00-15:45	<b>Plenary 6: Membrane-free, Ir-free nano-fluidic pure water electrolysis-multiple effects of overlapping electric double layers</b> <u>Jianbo Zhang</u> Tsinghua University, China <div style="text-align: right;">Session Chair: Shangfeng Du</div>	
15:45-16:15	<b>Closing ceremony</b> <div style="text-align: right;">Committee: Anthony Kucernak, Xianguo Li, Jianbo Zhang, Shangfeng Du</div>	

16:15-16:45 **Farewell coffee (Common Room)**

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(Floor: Ground, 0)

**Common Room - G19, MSRH**  
(Floor: Ground, 0)

**The Works, UREN**  
(Floor: Ground, 0)

## Poster presentations

### **P1: One-Dimensional Iridium Oxide Catalysts for OER in PEM Electrolysis**

**Alexandra Brochoire**, Dehua Hou, Shangfeng Du, Muhammad Tahir

University of Birmingham, UK

### **P2: A Novel Hydrogen-Manganese Redox Flow Battery**

**YuChen Sun**, Anthony Kucernak, Nigel Brandon

Imperial College London, UK

### **P3: Modelling And Performance Analysis of Two-Stage Intercooler for Energy Recovery in Compressor-Expander Module in Fuel Cell Systems**

**Min Zhang**, Robert Steinberger-Wilckens, Yousif Al-Sagheer

University of Birmingham, UK

### **P4: Photoelectrocatalytic Degradation of Chlorpyrifos Wastewater Paired with Biogas SOFC Based on PrBaMn<sub>2</sub>O<sub>5+δ</sub> Electrodes**

Doudou Gu<sup>(1)</sup>, Guan Zhang<sup>(1)</sup>, **Jing Zou**<sup>(2)</sup>

(1) Harbin Institute of Technology, China; (2) The Chinese University of Hong Kong, China

### **P5: Modelling Charge Carrier Transport Adjacent to Three Phase Boundaries Within Solid Oxide Fuel Cells by Considering Space Charge Layer Effect**

**Han Xu**

Xi'an Jiaotong University, China

### **P6: Long-Term Interface Fracture Behaviour of YSZ Anode/SrO-MgO-SiO<sub>2</sub> Glass-Ceramic Sealant/430 s.s. Interconnect System in Solid Oxide Fuel Cells (SOFC)**

**Kai Hu**<sup>(1)</sup>, Jiankang Zhou<sup>(3)</sup>, Xiucheng Zhang<sup>(4)</sup>, Zhihui Liu<sup>(1)</sup>, Xiang Xing<sup>(3)</sup>, Bi Wang<sup>(2)</sup>, Yuming Wang<sup>(1)</sup>, Zixi Wang<sup>(1)</sup>

(1) Tsinghua University, China; (2) State Key Laboratory of High-end Compressor and System Technology, China; (3) Shandong University, Weihai, China; (4) Zhongfu (Wuxi) New Energy Co., Ltd, China

### **P7: Design of Solid Oxide Electrolysis Cell System Integrated with Haber-Bosch Process for High Efficient Ammonia Production**

Jongyun Jung<sup>(1)</sup>, Hee-sun Shin<sup>(2)</sup>, **Taebeen Kim**<sup>(2)</sup>, Siwoong Kim<sup>(1)</sup>, Seunghun Oh<sup>(1)</sup>, Sanggyu Kang<sup>(1,2)</sup>

(1) Seoul National University, Republic of Korea; (2) Research Institute of Marine System Engineering, Republic of Korea

### **P8: Numerical Analysis and Optimization of Cascade SOFC Systems with Fuel Regenerator for High Electrical Efficiency**

**Taebeen Kim**<sup>(1)</sup>, Siwoong Kim<sup>(2)</sup>, Seunghun Oh<sup>(2)</sup>, Jongyun Jung<sup>(2)</sup>, Sanggyu Kang<sup>(1,2)</sup>

(1) Research Institute of Marine System Engineering, Republic of Korea; (2) Seoul National University, Republic of Korea

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(Floor: Ground, 0)

**P9: 2-Dimensional Dynamic Modeling and Simulation of PEM Water Electrolysis System**

*Haeseong Shin, Dohyung Jang, Jinyoung Ham, Heesun Shin, Sanggyu Kang*

Seoul National University, Republic of Korea

**P10: Dynamic Modelling and Simulation of Alkaline Water Electrolysis System**

*Dohyung Jang, Haeseong Shin, Jinyoung Ham, Heesun Shin, Sanggyu Kang*

Seoul National University, Republic of Korea

**P11: Design of Fuel Cell Propulsion System for Aircraft**

*Geoffrey Liu<sup>(1)</sup>, Nisha Jeyaganeshan<sup>(1)</sup>, Kelly Chow<sup>(1)</sup>, Shaela Suherli<sup>(1)</sup>, Yao Yu<sup>(1)</sup>, Xianguo Li<sup>(1)</sup>, Alexander Crain<sup>(2)</sup>, Patrick Zdunich<sup>(2)</sup>*

(1) University of Waterloo, Canada; (2) National Research Council of Canada, Canada

**P12: Anti-Corrosion Surface Treatment of Metallic Bipolar Plates to Enable Hydrogen Fuel Cells for Electric Aviation Applications**

*Pramoth Varsan Madhavan, Jinhe Zhang, Amirhossein Amirsoleymani, Adithya Legala, Shams Anwar, XiaoYu Wu, Xianguo Li*

University of Waterloo, Waterloo, Canada