

3rd MEEP Symposium 2019

3 – 4 July, KKL,
Lucerne, Switzerland

Microbial, Enzymatic & Bio-Photovoltaic Electrochemical Reactors

Fuel Cells & Electrolyser Systems

Chaired by: **Prof. Ioannis Ieropoulos; Bristol BioEnergy Center, UK**

MEEP SCOPE

The MEEP Symposium 2019 features all Microbial & Enzymatic Electrochemical Reactors, especially Microbial Fuel Cells, Electrolysers and Applications. It covers science and engineering, materials and manufacturing, components and systems, design, testing, integration and applications.

The 3rd International MEEP Symposium 2019 aims to further establish the biannual Microbial/Enzymatic Electrochemistry Platform (MEEP). It offers students, researchers, suppliers and industry, the opportunity to come together and share information and insights into these continually evolving and important technologies. This event will be held alongside the already well established and highly respected European Fuel Cell Forum (www.EFCF.com, since 1994), offering further opportunities to exchange with researchers and industry members in other fields of low temperature Fuel Cell & Electrolysers and Hydrogen research from around the world.

Session program

Wednesday, July 3

Club Rooms

12:00 On-site MEEP registration

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|-------|------------|--|--|--|
| 14:30 | M04 | Welcome - Keynote on Electroautotrophy - Microbial Interactions & Electrosynthesis | | S-Chair: Wolfgang Schuhmann, Pierangela Cristiani |
| | M0401 | Welcome by the Organizers | Michael Spirig, Fiona Moore, Olivier Bucheli | EFCF, Lucerne/Switzerland |
| | M0402 | Welcome by the Symposium Chair | Ioannis Ieropoulos | Bristol BioEnergy Center, UK |
| | M0403 | From an extremophilic community to an electroautotrophic production strain | Johannes Eberhard Reiner (1), Katharina Geiger (1), Max Hackbarth (2), Marielle Fink (3), Tobias Jung (1), Jonas Lapp (1), Sven Kerzenmacher (3), Harald Horn (2), Johannes Gescher (1)* | (1) Institute for Applied Biosciences, KIT, Karlsruhe, Germany, (2) Engler-Bunte-Institute, KIT, Karlsruhe, Germany, (3) Center for Environmental Research and Sustainable Technology (UFT), University of Bremen, Bremen, Germany. |
| | M0404 | Converting CO ₂ to Fuels and Chemicals with Microbial electrosynthesis (MES) | Paniz Izadi (1), Jean-Marie Fontmorin (1), Ian Head (2), and Eileen H. Yu (1)* | (1) School of Engineering, (2) School of Natural and Environmental Science, Newcastle University, UK. |
| | M0405 | Resilience of Microbial Fuel Cells to known antibiotics | Oluwatosin Obata (1)*, John Greenman (1,2), Ioannis Ieropoulos (1) | (1) Bristol BioEnergy Centre, Bristol Robotics Laboratory, (2) Biological, Biomedical and Analytical Sciences, University of the West of England, UK. |
| | M0406 | Improving electrode-assisted fermentation of platform chemicals in <i>Escherichia coli</i> | Laura-Alina Philipp (1)*, Sebastian Beblawy (1), Tobias Kabbeck (2), Johannes Gescher (1,2) | (1) Karlsruhe Institute of Technology, Institute for Applied Biosciences, Karlsruhe, Germany, (2) Karlsruhe Institute of Technology, Institute for Biological Interfaces, Eggenstein-Leopoldshafen, Germany. |
| 16:00 | | Coffee break & exhibition | | |
| 16:30 | M05 | Materials, Transfer Processes & reactor design I | | S-Chair: Bruno Allard, Benjamin Erable |
| | M0501 | Highly electrocatalytic non-precious materials for Oxygen Reduction Reaction and Oxygen Evolution Reaction for Energy Conversion and Storage Devices | H. S. Jang, Y.B. Kim, M.Y. Oh, J.J. Lee, K. S. Nahm* | School of Chemical Engineering, Department of Energy Storage and Conversion, Chonbuk National University, Republic of Korea. |
| | M0502 | Increased Current Production of <i>Shewanella oneidensis</i> with Electrospun Carbon Nanofibers is Directly Linked to Enhanced Biofilm Formation | Johannes Erben*, Xinyu Wang, Sven Kerzenmacher | University of Bremen, Department of Environmental Process Engineering, Bremen, Germany. |
| | M0503 | Dynamic evolution of electroactive biofilm controlled by external resistance of ceramic microbial fuel cells | Grzegorz Pasternak (1,2)*, John Greenman (1), Ioannis Ieropoulos (1) | (1) Bristol BioEnergy Centre, Bristol Robotics Laboratory, University of the West of England, Bristol, UK, (2) Laboratory of Microbial Electrochemical Systems, Faculty of Chemistry, Wrocław University of Science and Technology, Wrocław, Poland. |
| | M0504 | Riboflavin triggers <i>Shewanella oneidensis</i> biofilm formation in Bioelectrochemical Systems | Miriam Edel (1)*, Johannes Gescher (1,2) | (1) Karlsruhe Institute of Technology, Institute for Applied Biosciences, Karlsruhe, Germany, (2) Karlsruhe Institute of Technology, Institute for Biological Interfaces, Eggenstein-Leopoldshafen, Germany. |
| | M0505 | How does Microbial Electron Cross the Layer of Extracellular Polymeric Substances? | Yong Xiao (1), Enhua Zhang (1), Jingdong Zhang (2), Jens Ulstrup (2), Feng Zhao (1)* | (1) Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, China, (2) Department of Chemistry, Technical University of Denmark, Lyngby, Denmark. |
| 18:00 | | End of Sessions | | |
| 18:30 | | Network Evening - Swiss Surprise (extra tickets for 120.- pP available) | | |

Thursday, July 4

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| 09:00 | M06 | Keynote on Nano tools for electrocatalytic materials | | S-Chair: Johannes Gescher, Claudio Avignone-Rossa |
| | M0601 | Hydrogenases embedded in low potential redox polymers: from protected bioanodes to high current densities H ₂ /air biofuel cells. | Wolfgang Schuhmann | Faculty of Chemistry and Biochemistry, Ruhr University, Bochum, Germany. |
| 09:30 | M07 | Materials, Transfer Processes & reactor design II | | S-Chair: Mirella Di Lorenzo, Feng Zhao |
| | M0701 | Effect of different parameters on ceramic MFC performance fed with fresh urine | Asimina Tremouli (1,2)*, John Greenman (1), Ioannis Ieropoulos (1) | Bristol BioEnergy Centre, University of the West of England, Bristol, UK, (2) School of Chemical Engineering, National Technical University of Athens, Greece. |
| | M0702 | Advances in Air-cathodes and Ion-exchange Membranes for Microbial Desalination Cells | Pau Bosch-Jimenez (1)*, Martí Aliaguilla (1), M. d. Pilar Bernicola (1), Daniele Molognoni (1), Sonia Matencio (1), Diego Morillo (1), Sandra Martinez (1), Ruediger Schweiss (2), Almut Schwenke (2), Maarten Meijlink (3), Abdulsalam Alhadidi (3), E. Borràs (1) | (1) LEITAT Technological Center, Terrassa, Spain, (2) Technology and Innovation, SGLCarbon GmbH, Meitingen, Germany, (3) Fujifilm Manufacturing Europe B.V. P.O., L.J. Tilburg, The Netherlands. |
| | M0703 | Anode modification with conductive polymers coatings for applications in microbial fuel cell | Salma Bilal (1,2)*, Lars Krüger (1), Ulrike Krewer (1), Fabian Kubanek (1), Anwar ul Haq Ali Shah (3) | (1) Institute for Process and System Engineering TU Braunschweig, Germany, (2) National Centre of Excellence in Physical Chemistry University of Peshawar, Pakistan, (3) Institute of Chemical Sciences, University of Peshawar, Pakistan. |
| | M0704 | Increased power generation and enhanced treatment in Microbial Fuel Cell stack using activated carbon-modified anode | Iwona Gajda (1)*, John Greenman (1,2), Ioannis Ieropoulos (1) | (1) Bristol BioEnergy Centre, University of the West of England, Bristol, UK, (2) Department of Applied Sciences, University of the West of England, Bristol, UK. |
| 10:30 | | Coffee break & exhibition | | |
| 11:00 | M08 | Microbial Electrolysis & Scale up opportunities & challenges | | S-Chair: Fabian Fischer, Rachel Armstrong |
| | M0801 | Hydrogen Production By Thermotoga Neapolitana In Electrochemical Bioreactors | Pierangela Cristiani (1)*, Gaetano Squadrito (2), Giuliana dilippolito (3), Angelo Fontana (3) | (1) RSE – Ricerca sul Sistema Energetico S.p.A., Milan, Italy, (2) Institute of Advanced Technologies for Energy (ITAE), National Research Council (CNR), Messina, Italy, (3) Institute of Biomolecular Chemistry (ICB), National Research Council (CNR), Pozzuoli, Italy. |
| | M0802 | Effect of the kilning temperature of ceramic membranes on MFC power performance. | Maria Jose Salar Garcia*, John Greenman, Ioannis Ieropoulos | Bristol BioEnergy Centre, Bristol Robotics Laboratory, Bristol, UK. |
| | M0803 | Innovative Design of Microbial Fuel Cell for Integration into Selectively Programmable Bioreactor Wall | Jiseon You (1)*, Lauren Wallis (1), Michail-Antisthenis Tsompanas (2), Arjuna Mendis (1), John Greenman (1), Ioannis Ieropoulos (1) | (1) Bristol BioEnergy Centre, UWE, Bristol, UK, (2) Unconventional Computing Group, UWE, Bristol, UK. |
| | M0804 | Thermophilic nutrient to power conversions in a microbial fuel cell cascade fed with wet oxidation liquors | Gerty Gielen (1)*, John Andrews (1), Muthasim Fahmy (1), Christopher Francois (2), Ioannis Ieropoulos (2), Daniel Gapes (1) | (1) Scion, Rotorua 3046, New Zealand, (2) BBIC, University of the West of England, Bristol, UK. |
| | M0805 | Enhanced Electrical Contact of Microbes onto Multi-Walled Carbon Nanotube using Magnetite in Microbial Fuel Cell | In Ho Park (1), Kee Suk Nahm (1,2)* | (1) Department of Hydrogen and Fuel Cell Engineering, (2) School of Chemical Engineering, Chonbuk National University, Jeonju, Republic of Korea. |

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| 12:30 | M0806 | Wastewater continuous flow MEC: scale-up of a 3D graphite anode designed from experimental tests and numerical modelling | Emma Roubaud (1), Rémy Lacroix (2), Serge Da Silva (2), Luc Etcheverry (1), Alain Bergel (1), Régine Basséguy (1), Benjamin Erable (1)* | (1) Laboratoire de Génie Chimique, Université de Toulouse, CNRS, Toulouse, France, (2) 6T-MIC Ingénieries, Castanet-Tolosan, France. |
| 13:15 | M09 | Poster Session | | S-Chair: Ioannis Ieropoulos |
| | M0705 | Effect of Anolyte Recirculation on the Performance of Microbial Fuel Cell | Somdipta Bagchi*, Manaswini Behera | Indian Institute of Technology Bhubaneswar, Odisha, India. |
| | M0706 | Copolymers of ionic liquids with MMA and hPFSVE as novel proton exchange membranes | Victor M. Ortiz-Martínez, Lucía Gómez-Coma, Alfredo Ortiz*, Inmaculada Ortiz | Department of Chemical and Biomolecular Engineering, University of Cantabria, Santander, Spain |
| | M1007 | Fabrication parameters of ceramic membrane for Microbial Fuel Cells | Iwona Gajda (1)*, Xavier Alexis Walter (1), John Greenman (1,2), Ioannis Ieropoulos (1) | (1) Bristol BioEnergy Centre, University of the West of England, Bristol, UK, (2) Department of Applied Sciences, University of the West of England, Bristol, UK. |
| | M1008 | Banana peel hydrochar liquid as a feedstock for Microbial Fuel Cells | Fabio Flagiello (1,2), Mariagiiovanna Minutillo (2), Rosa Anna Nastro (1,2), Harvey Garcia Arellano (3), Claudio Avignone Rossa (1)* | (1) Department of Microbial Sciences, University of Surrey, Guildford, UK, (2) Department of Engineering, University of Naples Parthenope, Naples, Italy, (3) Department of Chemical and Process Engineering, University of Surrey, Guildford, UK. |
| | M1009 | Review on MFC for application to monitoring | Andrea Pietrelli (1,2)*, Bruno Allard (2), Vincenzo Ferrara (1) | (1) Sapienza University of Rome, Rome, Italy, (2) Institut national des sciences appliquées de Lyon, Villeurbanne, France. |
| | M1010 | Wastewater treatment with simultaneous methane production in a bioelectrochemical system | Marianne Haberbauer (1)*, Sophie Thallner (1), Hathaichanok Seelajaroen (2), Arne Ragosnig (3) | (1) Austrian Centre of Industrial Biotechnology (acib), Linz, Austria, (2) Linz Institute for Organic Solar Cells (LIOS), Johannes Kepler University, Linz, Austria, (3) RM Umweltkonsulentent ZT GmbH, Vienna, Austria. |
| | M1011 | Self-powered photosynthetic biosensor for pesticide detection in water | Dolores Gonzalez*, Mirella Di Lorenzo | Department of Chemical Engineering, University of Bath, Claverton Down, UK. |
| | M1012 | Non-invasive and flexible glucose/oxygen fuel cell for continuous monitoring of glucose | Carla Gonzalez-Solino (1,2)*, Elena Bernalte (1,2), Despina Moschou (1,3), Mirella Di Lorenzo (1,2) | (1) Centre for Biosensors, Bioelectronics and Biodevices (C3Bio), (2) Department of Chemical Engineering, (3) Department of Electronic and Electrical Engineering, University of Bath, UK. |
| | M1013 | Inspiring new scientists with microbial fuel cells | Jonathan Winfield*, Debbie Lewis, Pavlina Theodosiou, Ioannis Ieropoulos | Bristol BioEnergy Centre (B-BiC), University of the West of England, Bristol, UK. |
| 14:30 | M10 | Implementation, Systems Engineering & Emerging Applications | | S-Chair: Sven Kerzenmacher |
| | M1001 | Microbial Fuel Cell at the m3-scale for wastewater purification, electricity generation and storage | Maxime Blatter (1), Louis Delabays (2), Gérald Huguenin (2), Christian Cachelin (1), Fabian Fischer (1,3)* | (1) Institute of Life Technologies, HES-SO Valais-Wallis, Switzerland, (2) Embedded-Computing Systems, Haute-Ecole Arc, St-Imier, Switzerland, (3) Institute of Energy and Environmental Engineering, HES-SO Valais-Wallis, Switzerland. |
| | M1002 | Scalability of self-stratifying microbial fuel cells treating urine | Xavier Alexis Walter*, John Greenman, Ioannis Ieropoulos | Bristol BioEnergy Centre, University of the West of England, Bristol, UK. |
| | M1003 | Towards Low-cost, Simple and Biodegradable Microbial Fuel Cells for Energy Harvesting and Sensing Applications | Mirella Di Lorenzo | Centre for Biosensors, Bioelectronics and Biodevices (C3Bio), University of Bath, UK. |
| | M1004 | Coffee waste as feedstock for bioelectrochemical systems | Lina María Agudelo Escobar (1), Claudio Avignone Rossa (2)* | (1) School of Microbiology, University of Antioquia, Medellín, Colombia, (2) Department of Microbial Sciences, University of Surrey, Guildford, UK. |
| | M1005 | Floating microbial fuel cells operating for long time in anoxic tanks of a wastewater treatment plant | Pierangela Cristiani (1)*, Francesca Pizza (2), Iwona Gajda (3), John Greenman (3), Paolo Bonelli (4), Ioannis Ieropoulos (3) | (1) RSE – Ricerca sul Sistema Energetico S.p.A., Milan, Italy, (2) Milano Depur SpA, WWTP of Milano-Nosedo, Milan, Italy, (3) Bristol BioEnergy Centre, University West England, Bristol, UK, (4) CISE 2007, Milano. c/o FOIM v. G.B. Milan, Italy. |
| Keynote | M1006 | Summary and Closing ceremony | Ioannis Ieropoulos, Michael Spirig, Fiona Moore and Olivier Bucheli | Bristol BioEnergy Center, UK & European Fuel Cell Forum, Switzerland. |
| CLOSING | | | | |

16:30 End of sessions & end of official part of MEEP Symposium

Recommended:

16:30 MEEP Apéro in the EFCF exhibition area, optional booth visits (free)

19:20 Dinner on the Lake - Boarding at 19:20, lake side of KKL (extra tickets for 120.- CHF pP available)

Offer for Wednesday morning, 3 July

08:00 EFCF on-site registration, also open to MEEP participants, *special tickets available

09:00 EFCF 2019: first morning session block* >>>>>>

A01: Opening, **Keynotes: EU programme FCH JU & Industry Perspective Hydrogen**

12:30 EFCF lunch on KKL Terrace - also for GSM participants*

A02: H2 economy

13:15 EFCF poster session & exhibition visit (free)

Only with special invitation:

10:00 MEEP Scientific Advisory Board meeting

Possibility for Friday, 5 July

08:00 EFCF on-site registration open *special tickets available

EFCF Sessions

09:00 EFCF 2019:

A12: Keynote: Industry Perspective **Electrolyser**

Conference, Poster area & Exhibition >>>>>>

A13: Electrolyser & FC for **Grid Balancing**

B12: **Photoelectrochemical** Water Splitting

- incl. Breaks, Documentation and Lunch - also for GSM participants*

A14: Electrolyser: OEM & Tier 1 **Status Report**

B12: Pt-free Catalysts

16:15 www.EFCF.com/FA

A15: **FC Applications**

B12: Diffusive Media for FC & Electrolysers

A16: Closing & **Keynote** by the Gold Medal Winner

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The European Fuel Cell Forum is an international reference conference with exhibition & tutorials in the emerging field of "Fuel Cells, Electrolysers & H2 Processing". It takes place since 1994 (23rd times), always at the beginning of July in Lucerne/Switzerland.

Figures

Participants: MEEP symposium this year between 50-80 expected; EFCF totaly usually between 350-550;

Exhibitors/Sponsors usually between 20-35;

EFCF Tutorial participants: Fuel Cells & Hydrogen - FCH (kick-start) 15-25; EIS (advanced) 20-30