

Final
ANNOUNCEMENT

EFCF²⁰¹⁹
MEEP
Microbial/Enzymatic Electrochemistry Platform

Microbial, Enzymatic & Bio-Photovoltaic Electrochemical Reactors

Fuel Cells & Electrolyser Systems

3rd International

MEEP Symposium 2019

3–4 July 2019, Lucerne Switzerland

Symposium Chair **Prof. Ioannis Ieropoulos**
Bristol BioEnergy Center, UK

Featuring
Materials, Transfer Processes
Reactor Design
Microbial Electrolysis
Scale up Opportunities & Challenges
Implementation, Systems Engineering
Emerging Applications

Keynotes on
Electroautotrophy Microbial Interactions & Electrosynthesis
Nano tools for electrocatalytic materials

Organiser EUROPEAN FUEL CELL FORUM
Integrated in EFCF 2019 www.EFCF.com

www.I-MEEP.com



Scope

www.I-MEEP.com/Scope

The idea behind the **3rd International MEEP Symposium**, is to establish a biannual **Microbial/Enzymatic Electrochemistry Platform (MEEP)**. MEEP is offering students, researchers, suppliers and industry the opportunity to come together and share information and insights in these interesting and continuously expanding fields of science and technology. This event will be held alongside the already well established and highly respected **European Fuel Cell Forum (www.EFCF.com)**, offering further opportunities to meet researchers and industry members in other fields of low temperature Fuel Cell & Electrolysers and Hydrogen research from around the world.

The MEEP Symposium covers science and engineering, materials and manufacturing, components and systems, design, testing, integration and applications, for all **Microbial & Enzymatic Electrochemical Reactors**, especially **Microbial Fuel Cells, Electrolysers** and **Applications**. A specially formed **Scientific Advisory Board (SAB)** consisting of recognized international experts ensures that the contributions are of a high standard, ensuring value and interest for participants of all levels.

Symposium

www.I-MEEP.com/AuthorCenter

Events

www.I-MEEP.com/Events

Wednesday, July 3

12:00 On-site MEEP registration

14:30 M04 **Welcome – Keynote on Electroautotrophy – Microbial Interactions & Electrosynthesis**

S-Chair: Wolfgang Schuhmann,
Pierangela Cristiani

16:30 M05 **Materials, Transfer Processes & reactor design I**

S-Chair: Bruno Allard, Benjamin Erable

18:30 **Network Evening – Swiss Surprise** (extra tickets for 120.– pP available)

Thursday, July 4

09:00 M06 **Keynote on Nano tools for electrocatalytic materials**

S-Chair: Johannes Gescher, Claudio Avignone-Rossa

09:30 M07 **Materials, Transfer Processes & reactor design II**

S-Chair: Mirella Di Lorenzo, Feng Zhao

11:00 M08 **Microbial Electrolysis & Scale up opportunities & challenges**

S-Chair: Fabian Fischer, Rachel Armstrong

13:15 M09 **Poster Session**

S-Chair: Ioannis Ieropoulos

14:30 M10 **Implementation, Systems Engineering & Emerging Applications**

S-Chair: Sven Kerzenmacher

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)

Venue

www.I-MEEP.com/Lucerne

The **MEEP Symposium** is held at the Culture and Convention Centre Lucerne (KKL www.kkl-luzern.ch) in parallel with EFCF 2019, with Tutorials and Exhibition as well as a Grid Service Markets event. The KKL is a well-known location on the picturesque waterfront of the Lake Lucerne, easy to reach by plane and train, and within a short distance from charming hotels and the historical town centre.

Fees

www.I-MEEP.com/Fee

- Students, trainees and unemployed persons etc. with valid identification 600 CHF incl. 7.7% VAT where applicable
- Members of government, universities, consultants etc. 800 CHF incl. 7.7% VAT where applicable
- Late charge On-Site 150 CHF incl. 7.7% VAT where applicable

One Swiss Franc ("CHF") is valued at about 0.88 EURO, 1.03 US Dollar, 113 YEN, 6.87 CNY (Sep 2018). The fees include access to MEEP symposium (sessions/posters), EFCF 2019 exhibition, 4 July 2019 (sessions/posters), **conference proceedings, conference bag, business lunch, refreshments** and the **Dinner on the Lake** on Thursday. Optional: Swiss Surprise on Wednesday (120 CHF pp). **Post symposium access** to all allowed presentations and available ISBN proceedings back to 1994 also from EFCF.

Symposium Chair

www.brl.ac.uk



Prof. Ioannis Ieropoulos, Bristol BioEnergy Center, UK

is a Professor of Bioenergy & Self-Sustainable Systems and Director of the Bristol BioEnergy Centre, at the Bristol Robotics Laboratory, UWE. He has an interest in waste utilisation and energy autonomy and produced the EcoBot family of robots, powered by microbial fuel cells (MFCs) fed on organic waste; the latest example is Row-bot. He leads a Gates Foundation funded program, developing

MFCs for sanitation, looking also into biodegradable materials. He has published >90 peer reviewed journal papers, generated >£7M of research income in the last 8 years and is frequently invited at international conferences, such as ECS. He is a member of the EPSRC Peer Review College, a reviewer for the EU and numerous scientific Journals and the Section Editor for SETA (Elsevier).

Scientific Advisory Board

www.I-MEEP.com/SAB

- Dr. Bruno Allard / Ecole de Lyon, France
- Prof. Rachel Armstrong / Newcastle University, UK
- Dr. Claudio Avignone-Rossa / University of Surrey, UK
- Dr. Alain Bergel / CNRS, France
- Prof. Haluk Beyenal / Washington State University, USA
- Ms. Pierangela Cristiani / Ricerca sul Sistema Energetico, Italy
- Dr. Mirella Di Lorenzo / University of Bath, UK
- Dr. Benjamin Erable / CNRS, France
- Prof. Fabian Fischer / HEVS, Switzerland
- Prof. Johannes Gescher / KIT, Germany
- **Prof. Ioannis Ieropoulos / Bristol BioEnergy Centre, UWE, UK (Chair)**
- Prof. Sven Kerzenmacher / Bremen University, Germany
- Dr. Carlo Santoro / University of the West of England, UK
- Dr. Eileen Yu / Newcastle University, UK
- Prof. Feng Zhao / Chinese Academy of Sciences, China

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

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 Escherichia coli	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 Shewanella oneidensis 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 Shewanella oneidensis 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

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.

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* >>>>>>

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

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

A01: Opening, **Keynotes: EU programme FCH JU & Industry Perspective Hydrogen**
A02: H2 economy

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

09:00 EFCF 2019:

Conference, Poster area & Exhibition >>>>>>
incl. Breaks, Documentation and Lunch - also for GSM participants*

16:15 www.EFCF.com/FA

EFCF Sessions

A12: Keynote: Industry Perspective **Electrolyser**

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

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

A15: **FC Applications**

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

B12: **Photoelectrochemical** Water Splitting

B12: Pt-free Catalysts

B12: Diffusive Media for FC & Electrolysers

www.i-MEEP.com

EFCF

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.

www.EFCF.com

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