9.00 Opening and greetings  
Prof. Dr.-Ing. Christian Doetsch, Jan Girschik  
Fraunhofer UMSICHT, Oberhausen  

KEYNOTES  
Chair: Dr. Benedikt Rösen, Senior-Experte Energieforschung, Cluster EnergieForschung NRW  

9.15 Application of electrochemical processes to energy and environmental applications  
Prof. Dr. Edward Roberts  
University of Calgary, Alberta, Canada  

10.00 Free from fabrication of electrochemical membrane reactors  
Prof. Dr. Edward Roberts  
University of Calgary, Alberta, Canada  

10.45 COFFEE BREAK  

SESSION 1  
FUNCTIONAL COMPONENTS  
Chair: Prof. Dr. Ulf-Peter Apfel, Fraunhofer UMSICHT, Oberhausen  

11.00 One for all or one for each application? Recent advances in membrane development for electrochemical energy converters  
Dr. Matthias Breitwieser  
IMTEK – Department of Microsystems, University of Freiburg  

11.20 Characterization of gas-diffusion electrodes through experiment and simulation  
Prof. Dr. Thomas Teuch  
Clausthal University of Technology, Clausthal  

11.40 Degradation and SOC monitoring @ vanadium flow batteries  
Dr. Claudia Windisch  
DECHEMA-Forschungsinstitut (DFI), Frankfurt/Main  

12.00 Carbon fiber materials for electrochemical energy converters  
Dr. Frieder Schekia  
Karlsruhe Institute of Technology (KIT), Karlsruhe  

12.20 Poster pitch  
Chair: Prof. Dr. Ulf-Peter Apfel, Fraunhofer UMSICHT, Oberhausen  

12.40 LUNCH BREAK  

SESSION 2  
CELL DESIGN AND FLUID FLOW  
Chair: Prof. Dr. Christian Doetsch, Fraunhofer UMSICHT, Oberhausen  

13.40 A tubular cell concept for redox flow batteries  
Simen Rassel  
RWTH Aachen University, Aachen  

14.00 PEM fuel cells: Variety of cell and stack designs  
Dr. Ludwig Uhwies  
Center for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW), Stuttgart  

14.20 Electrochemical cells for water desalination and material separation  
Dr. Carsten Pietzka  
Fraunhofer IGB, Stuttgart  

14.40 PhotoFlow: Solar light rechargeable redox flow battery  
Dr. Christoph Haase  
DECHEMA-Forschungsinstitut (DFI), Frankfurt/Main  

15.00 COFFEE BREAK  

SESSION 3  
STACK DESIGN, TESTING AND SEALING TECHNOLOGY  
Chair: Dr. Peter Beckhaus, The Hydrogen and Fuel Cell Center ZBT, Duisburg  

15.20 Bipolar plates: Functional core components of electrochemical cells  
Dr. Michael Junemann  
Fraunhofer UMSICHT, Oberhausen  

15.40 Coating characterization of metallic bipolar plates in fuel cells – from pre-coated materials to stack level results  
Dr. Jörg Kanstedt, Lars Kühlmann  
The Hydrogen and Fuel Cell Center ZBT, Duisburg  

16.00 Seal-less stack designs for batteries and electrolysers  
Lukas Wilhelm, Lukas Hoof  
Fraunhofer UMSICHT, Oberhausen  

16.20 Summary and conclusion  

16.30 END OF THE COLLOQUIUM  

For the first time ever, the “E3C – Electrochemical Cell Concepts Colloquium” is taking place, organized by the Fraunhofer UMSICHT. It was established to serve as a platform for the interdisciplinary exchange of innovations and scientific findings in the field of electrochemical reactors. Due to the current situation the event is designed as an online colloquium.

The focus of this year’s colloquium lies on the question which similarities and potential combinations the designs of the different reactor types have in common. In particular, the speeches are about the cell concepts of flow reactors – like flow batteries, fuel cells, electrolysis, electrosynthesis or electrodialysis cells. Scientists from different fields of application can combine their expertise so that the technologies can benefit from each other’s developments and innovations, in order to advance the overall state of research.

This interdisciplinary exchange on the design of electrochemical reactors is divided into three sessions:

- Functional components  
- Cell design and fluid flow  
- Stack design, testing and sealing technology
**Fraunhofer UMSICHT** is a pioneer for sustainable energy and raw materials management by supplying and transferring scientific results into companies, society and politics. The dedicated UMSICHT team researches and develops, together with partners, sustainable products, processes and services, which inspire. This is our mission.

**Competence of the department**  
"Electrochemical Energy Storage"  
We develop electrochemical energy storage systems for the demand-oriented provision of electricity. Our concepts contribute to the sector coupling of energy and production. We specialize in the development and manufacture of batteries and in the technological, economic, and systemic evaluation of power-to-x technologies.

**REGISTRATION AND PARTICIPATION FEE**  
Please register by **May 7th** using our online registration on the internet at "s.fhg.de/E3C20".

The participation fee is 40 € and will be charged by invoice. A small contingent of free tickets is available for students (certificate of study required). If this is exhausted, the reduced participation fee is 15 €. You will receive a confirmation of participation by e-mail. In case of non-participation without prior written cancellation (at least one week before the event), we charge the full participation fee. Members of the UMSICHT-Förderverein attend the event free of charge (1 participant per company).

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