

SFERA III – Summer School 2022 – Solar Thermochemistry**September 15th – 16th****Martin Roeb** - German Aerospace Center**Talk title:** Status and perspective of solar thermochemical fuels, chemicals, and basic materials production

Dr. Martin Roeb holds a diploma in chemistry from the University of Cologne and a doctoral degree in physical chemistry from the same university. Since 1999 he has been working as a scientist, project manager and group leader in DLR's Solar Research Division in the field of solar high temperature applications. In the beginning of 2021 he took over the acting lead of the department "Solar Chemical Process Development" in the newly founded DLR Institute of Future Fuels. He has been work package leader and coordinator of several domestic and EU projects on solar high temperature processes and in particular on solar fuels. His research interests address processes and materials related to solar thermochemical water and CO₂ splitting, solar upgrading of hydrocarbons, high temperature electrolysis and solar recycling and production processes of chemical commodities. He has been involved in international cooperation in the context of the IEA, EERA, SOLARPACES and Hydrogen Europe Research. He used to be the DLR representative in the project HYDROSOL, which has been awarded by the Eco Tech Award Expo 2005, the Technical Achievement Award of the International Partnership for the Hydrogen Economy 2006 and the Descartes Prize 2006 for Scientific Collaborative Research.

Sophia Haussener - Ecole Polytechnique Fédérale de Lausanne**Talk title:** Solar fuel processing by concentrated light and photoelectrochemistry

Sophia Haussener is an Associate Professor heading the Laboratory of Renewable Energy Science and Engineering at the Ecole Polytechnique Fédérale de Lausanne (EPFL). She received her MSc (2007) and PhD (2010) in Mechanical Engineering from ETH Zurich. Between 2011 and 2012, she was a postdoctoral researcher at the Joint Center of Artificial Photosynthesis (JCAP) and the Energy Environmental Technology Division of the Lawrence Berkeley National Laboratory (LBNL). She is the vice president of EPFL's research award commission (since 2021). She has published over 80 articles in peer-reviewed journals and conference proceedings, and 2 books. She has been awarded the ETH medal (2011), the Dimitris N. Chorafas Foundation award (2011), the ABB Forschungspreis (2012), the Prix Zonta (2015), the Global Change Award (2017), a Starting Grant of the Swiss National Science Foundation (2014), and the Raymond Viskanta Award on Radiative Transfer (2019). She is a co-founder of the startup SoHHytec aiming at commercializing photoelectrochemical hydrogen production. She is the former chair of the American Society of Mechanical Engineers (ASME) Solar Energy Division, a member of the scientific board of the Liquid Sunlight Alliance, and acts as a Member of the Scientific Advisory Council of the Helmholtz Zentrum.

Jonathan Scheffe - University of Florida**Talk topic:** Solar reforming of natural gas

Jonathan Scheffe is an Associate Professor in the Department of Mechanical and Aerospace Engineering at the University of Florida. Prof. Scheffe is Principle Investigator of the Renewable Energy Conversion Laboratory that is focused on research in the area of conversion and storage of solar

energy. Applications include the production of renewable fuels/electricity, H₂ production and fuel reforming. He is the former chair of the American Society of Mechanical Engineers (ASME) Solar Energy Division and has co-authored more than 35 peer reviewed publications in the field of solar thermal energy conversion. Prof. Scheffe has received research funding from the U.S. Department of Energy, Synhelion SA, Florida Department of Transportation, Duke Energy and Qatar National Research Foundation.

Alfonso J. Carrillo - Universitat Politècnica de València

Talk topic: Redox oxides for thermochemical heat storage in CSP plants

Dr. Alfonso J. Carrillo holds an M.Sc. in Chemical Engineering from Universidad de Salamanca (Spain), an M.Sc. in Renewable Energies from Universidad de León (Spain), and a Ph.D. in Chemical Engineering from Universidad Rey Juan Carlos (Spain). His Ph.D. research was conducted at IMDEA Energy (Spain) focusing on oxides for solar thermochemical energy storage. Then, he moved to the Electrochemical Materials Laboratory to perform his postdoctoral research on redox materials for solar-to-fuel thermochemical conversion, first at ETH Zurich (Switzerland), and after at the Massachusetts Institute of Technology, MIT (USA), where he was 2018 Eni-MIT Energy Fellow. He was awarded the Energy and Environmental Research Grant by Fundación Iberdrola, Juan de la Cierva Formación by the Spanish Ministry of Science, and recently, with a Junior Leader Fellowship by Fundación LaCaixa. He works at the Energy Conversion and Storage group at ITQ, located at Universitat Politècnica de València (Spain), since January 2019, with a focus on redox oxides for energy storage and production of renewable fuels.

Simon Ackermann – Synhelion AG, Switzerland

Talk topic: Synhelion's work in commercializing applications in solar thermochemistry

Simon received his PhD degree in Mechanical and Process Engineering from ETH Zurich. He joined Synhelion in 2018. Simon has more than ten years of experience in process thermodynamics, high-temperature chemistry, experimental testing, data analysis, and numerical modeling. He published several articles in scientific journals about his research work at ETH Zurich. In 2016, Simon received the prestigious ASME Solar Energy Division Graduate Student Award for his doctoral thesis.

Brendan Bulfin - ETH Zurich

Talk topic: Non-stoichiometric redox materials and their applications in thermochemical processes.

Brendan is a research scientist and Lecturer at ETH Zurich's Department of Mechanical and Process Engineering, where he has worked since autumn 2017. He is the current chair of Solar Chemistry for ASME. From May 2015 to August 2017 he held a postdoctoral research position at the Institute of Solar Research of the German Aerospace Center. His research interests include multi-phase thermochemistry, and materials science in the area of redox oxides. Currently his research is focused on redox materials and process design for air separation and fuel production. He holds a PhD in Physics and a BA in Theoretical Physics from the University of Dublin (Trinity College Dublin).