

21st Symposium on Modeling and Experimental Validation of Electrochemical Energy Technologies

Conference Program

Preliminary Program as of 17 January 2025

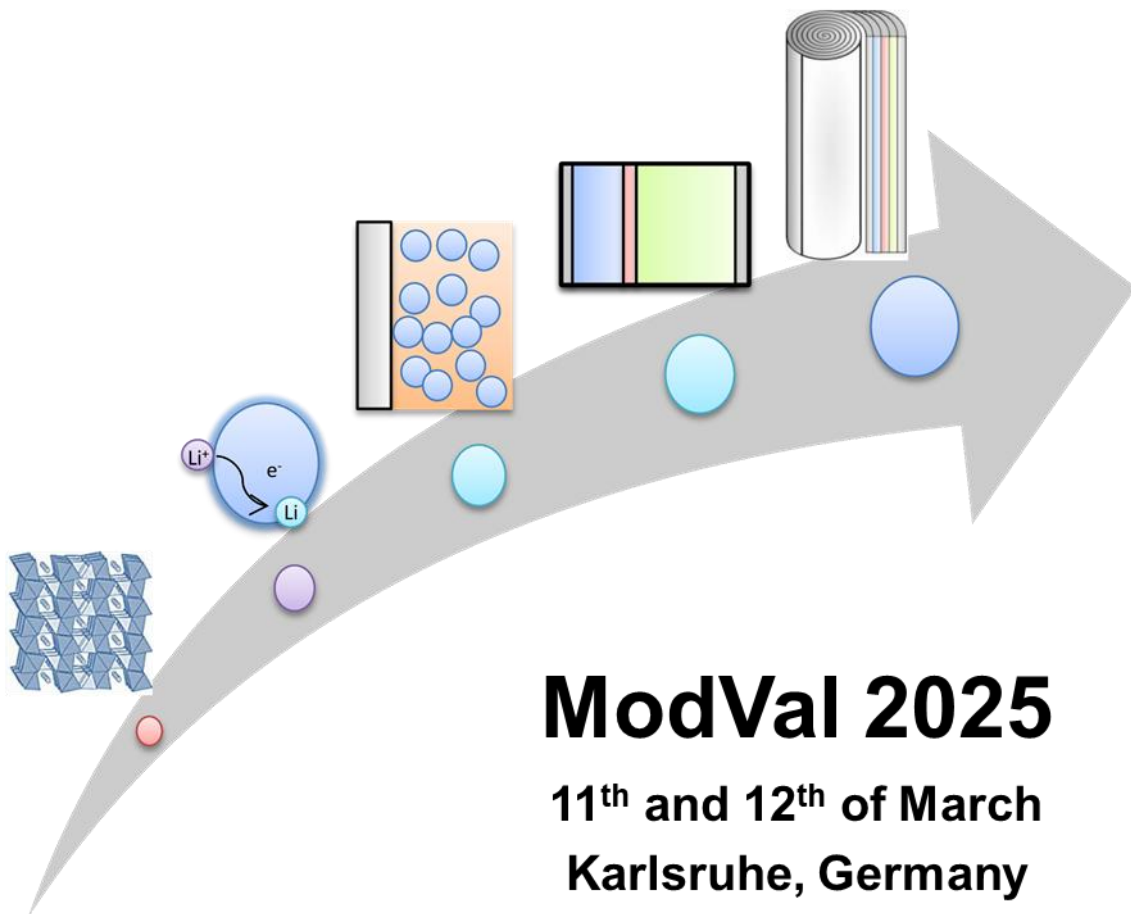


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Exhibitors

Batemo GmbH
www.batemo.com



GFS Fuel Cells GmbH
www.gfs-fuelcells.de



Math2Market GmbH
www.math2market.com



Zahner-Elektrik GmbH & Co. KG
www.zahner.de



Program Overview

Monday March 10th

18:00	Registration opens
From 18:00	Get-together and evening buffet (open until 21:00) at conference venue

Tuesday March 11th

07:30	Registration opens	
08:45	Welcome	
09:00	Plenary 1	
09:50	Short Break	
	Session A: Energy Conversion	Session B: Energy Storage
10:00	Session A1: <i>Fuel Cell Systems</i>	Session B1: <i>Hysteresis</i>
11:00	Coffee Break	
11:30	Session A2: <i>PEMFC Stacks</i>	Session B2: <i>Next-Generation</i>
12:30	Lunch Break	
13:40	Session A3: <i>PEMFC Cells 1</i>	Session B3: <i>Aspects of Battery Design</i>
14:50	Coffee Break	
15:10	Poster Session	
16:40	Short Break	
16:50	Session A4: <i>PEMFC Cells 2</i>	Session B4: <i>Degradation</i>
19:30	Conference Dinner	

Wednesday March 12th

09:00	Plenary 2	
09:50	Short Break	
	Session A: Energy Conversion	Session B: Energy Storage
10:00	Session A5: <i>Solid oxide cells</i>	Session B5: <i>Particle & Electrode Microstructure</i>
11:00	Coffee Break	
11:20	Poster Session	
12:30	Lunch Break	
13:40	Session A6: <i>Electrolysis</i>	Session B6: <i>Parameterization & Characterization</i>
15:10	Short Break	
15:20	Poster Award, ModVal 2026 Announcement, Closing Remarks	

Oral Program

Monday March 10th, Evening

18:00	Registration opens
19:00	Get-Together – Conference Venue

Tuesday March 11th, Morning 1

07:30	Registration opens
08:45	Welcome
09:00	David Howey (University of Oxford) Impedance as a battery modelling and diagnostics tool
09:50	Short Break

	Session A – <i>Energy Conversion</i>	Session B – <i>Energy Storage</i>
10:00	Session A1: <i>Fuel Cell Systems</i>	Session B1: <i>Hysteresis</i>
10:00	Andraž Kravos (University of Ljubljana) Advanced Model-Based Framework for State-of-X Diagnostics in Low- and High-Temperature Proton Exchange Membrane Fuel Cells	Jamie Foster (University of Portsmouth) The Newman model for phase-change electrodes: physics-based hysteresis
10:20	Mohammad Shojayian (Simon Fraser University) Investigation and Optimization of a Battery-Hybridized Fuel Cell Electric Vehicle for Durability and Fuel Consumption	Lukas Köbbing (German Aerospace Center) Chemo-Mechanical Core-Shell Model Explaining the Silicon Voltage Hysteresis and Long-Term Relaxation
10:40	Dante Fronterotta (École Polytechnique Fédérale de Lausanne) Long-term Predictive Analysis of a μ - CHP Solid Oxide Fuel Cell System	Emmanuelle Hagopian (University of Oxford) Voltage Hysteresis Experiments to Inform Physics-Based Models
11:00	Coffee Break	

Tuesday March 11th, Morning 2

Session A – <i>Energy Conversion</i>		Session B – <i>Energy Storage</i>
11:30	Session A2: <i>PEMFC Stacks</i>	Session B2: <i>Next-Generation</i>
11:30	<p>Sébastien Kawka (Univ. Grenoble Alpes)</p> <p>Stress heterogeneities inside PEMFC stacks: a homogenization method</p>	<p>Namrata Jaykhedkar (IFP Energies nouvelles)</p> <p>Comparative analysis of ethylene carbonate decomposition in Li₂CO₃- and Na₂CO₃-based solid electrolyte interphases</p>
11:50	<p>Jakob Träger (TU Braunschweig)</p> <p>PEMFC with dead-ended anode for hydrogen-powered commercial aircraft</p>	<p>Max Okrashevski (German Aerospace Center)</p> <p>A Scale-Resolved Numerical Operando Approach for Lithium-Sulfur Batteries</p>
12:10	<p>Henning Becker (TU Clausthal)</p> <p>A network model-based analysis of stray currents in electrochemical stacks and development of design strategies for optimized stack layouts</p>	<p>Elizabeth Olisa (Imperial College London)</p> <p>What is Missing from Current Li-S Models to Predict Coin-Cell Behaviour?</p>
12:30	Lunch Break	

Tuesday March 11th, Afternoon 1

Session A – Energy Conversion		Session B – Energy Storage
13:40	Session A3: <i>PEMFC Cells 1</i>	Session B3: <i>Aspects of Battery Design</i>
	<i>Keynote A3</i>	<i>Keynote B3</i>
13:40	Ulrich Sauter (Robert Bosch GmbH) Towards virtual design of Fuel Cells and Electrolyzers	Edwin Knobbe (BMW Group) The role of computational fluid dynamics in battery cell development
14:10	Martin Andersson (Lund University) Water Management in PEMFCs: Volume of Fluid Modeling of Two- phase Flow in Gas Diffusion Layers and the Gas Channels	Niklas Weber (Karlsruhe Institute of Technology) Thermal Runaway Prevention and Mitigation: From Cell Level Insights to System Level Strategies
14:30	Sercan Erdogan (Zentrum für BrennstoffzellenTechnik GmbH) Optical investigation and quantification of liquid water in the cathode side gas channels of PEM fuel cells	Sunil Kumar Rawat (Imperial College London) How to Design a Zero-Degradation Battery: Compensating for Loss of Lithium Inventory in LFP Cells with LFO Additives
14:50	Coffee Break	
15:10 – 16:40	Poster Session	
16:40	Short Break	

Tuesday March 11th, Afternoon 2

	Session A – <i>Energy Conversion</i>	Session B – <i>Energy Storage</i>
16:50	Session A4: <i>PEMFC Cells 2</i>	Session B4: <i>Degradation</i>
16:50	<p>Tim Dörenkamp (Paul Scherrer Institute)</p> <p>Probing 3D-Printed Model-Architectures for Enhanced Water Management in Polymer Electrolyte Fuel Cells</p>	<p>Micha Philipp (German Aerospace Center)</p> <p>Parameterizing physics-based degradation models in Li-ion batteries with Bayesian methods</p>
17:10	<p>Roman Schärer (Zurich University of Applied Sciences)</p> <p>Electrochemical Interface Model Coupling Oxygen Reduction and Degradation Reactions in the Cathode Catalyst Layer of a PEMFC</p>	<p>Mohammed Asheruddin Nazeeruddin (Imperial College London)</p> <p>Analysis of Reservoirs in Lithium-Ion Cells: Strategies for Cell Design and Cycling Protocols</p>
17:30	<p>Miroslav Hala (University of Chemistry and Technology Prague)</p> <p>Investigating Platinum Gradient Effects on Performance of PEM Fuel Cells Using Agglomerate Models</p>	<p>Patricia Ogochukwu Mmeko (Offenburg University of Applied Sciences)</p> <p>An aging-sensitive and physically-informed equivalent circuit model for predicting the lifespan of lithium-ion batteries</p>
17:50	<p>Anne-Christine Scherzer (Fraunhofer ISE)</p> <p>Simulating Morphology and Degradation of PEMFC Cathode Catalyst Layers with Porous Carbon Supports</p>	<p>Michael Danzer (University of Bayreuth)</p> <p>A spatially resolved electrode model for the simulation of lithium deposition and stripping in graphitic anodes</p>
19:30	Conference Dinner	

Wednesday March 12th, Morning 1

09:00	Adam Weber (Lawrence Berkeley National Laboratory) Importance of Mass Transfer in Hydrogen Technologies	
09:50	Short Break	
	<i>Session A – Energy Conversion</i>	<i>Session B – Energy Storage</i>
10:00	Session A5: <i>Solid Oxide Cells</i>	Session B5: <i>Particle & Electrode Microstructure</i>
10:00	Daniel Ewald (Karlsruhe Institute of Technology) Utilization of a validated 0D approach for 1D SOFC performance modeling	Maximilian Fath (BASF SE) Modelling the Impact of Secondary Particle Cracks and Pores on Transport and Kinetics in NCM Cathodes
10:20	Shuang Zhao (North China Electric Power University) Numerical simulation of multi-physics and local electrochemical characteristics of hythane-fueled SOFC	Simon Daubner (Imperial College London) High through-put simulations for battery microstructure characterization and design
10:40	René Lorenz (German Aerospace Center) From Cells to Multi-Stack Modules: Model Validation and Simplification Approaches for Scaled-up Solid Oxide Cell Systems	Matthias Neumann (Graz University of Technology) Data-driven stochastic 3D modeling of the nanoporous binder-conductive additive phase in battery cathodes
11:00	Coffee Break	
11:20 – 12:30	Poster Session	
12:30	Lunch Break	

Wednesday March 12th, Afternoon 1

Session A – Energy Conversion		Session B – Energy Storage
13:40	Session A6: <i>Electrolysis</i>	Session B6: <i>Parameterization & Characterization</i>
	<i>Keynote A6</i>	<i>Keynote B6</i>
13:40	Etienne Boutin (Ecole Polytechnique Fédérale de Lausanne) Carbon Monoxide Effect on Hydrogen Production During CO ₂ Electrochemical Reduction at Silver Electrodes: A Combined Experimental-Modeling Study	Fridolin Röder (University of Bayreuth) Pitfalls of Diffusion Coefficient Determination for P2D Battery Model Parameterization
14:10	Ashoke Raman Kuppa (Forschungszentrum Jülich GmbH) Data-driven approach for modeling and sensitivity analysis of a Proton-exchange membrane water electrolyzer	Anne Heß (Karlsruhe Institute of Technology) A Combined Experimental and Modeling Approach to Transfer Experimental Test Cell to Automotive Pouch Cell Behavior
14:30	Supriya Bhaskaran (Otto-von-Guericke-Universität Magdeburg) Pore-scale investigation of anodic porous transport layer of PEM water electrolyzer: Experimental and Lattice Boltzmann simulations	Bansidhar Patel (MPI for Dynamics of Complex Technical Systems) Data-Driven Analysis of Relaxation Time Distributions in Electrochemical Systems Using the Loewner Framework
14:50	Wiebke Schrader (Karlsruhe Institute of Technology) Numerical Investigation of Two-phase Flow Effects on Species Transport in Electro-chemical Systems	Andreas Markert (Karlsruhe Institute of Technology) Simultaneous Measurement of EIS and MRI of Lithium-Ion Batteries
15:10	Short Break	
15:20 – 16:00	Poster Award , ModVal 2026 Announcement, Closing Remarks	

Poster Program

A. Energy Conversion

Christian Rissler (Lund University)

Numerical Modeling of Two-Phase Flows in Electrolyzer Channels: Towards Optimized Thermal and Flow Management

Venu Agarwal (EPFL)

Modelling Water Transport in Bipolar Membranes for CO₂ Electrolysis Application

Erwan Tardy (University Grenoble Alpes)

Modeling of Anion Exchange Membrane Electrolysis: Impact of KOH Concentration on Electrochemical Performance

Roman Kodým (University of Chemistry and Technology Prague)

Multidimensional Mathematical Modelling Study of Mass and Charge Transfer Limitations in Alkaline Water Electrolysis: Effect of Separator

Katerina Hradecna (UCT Prague)

Effect of Catalyst to Binder Ratio on the Performance of Alkaline Membrane Water Electrolysis: A Mathematical Modeling Study

Vladimir Sovljanski (EPFL)

Accurate Li-ion Cell Parameters Estimation from Impedance Measurements: Methods and Applications

Jannik Heitz (Forschungszentrum Jülich GmbH)

Investigating the Role of Ionomer Distribution on Catalyst Stability in PEM Fuel Cells with a Hierarchical Modeling Approach

Abhinav Bhanawat (École Polytechnique Fédérale de Lausanne (EPFL))

Efficiency limits for photoelectrochemical glycerol oxidation combined with hydrogen evolution

Lourenço Vieira (Zurich University of Applied Sciences)

Mechanistic study and parameter estimation of a multi-electron transfer organic synthesis

Niklas Opper (Karlsruhe Institute of Technology (KIT))

Flow Cell Electrolysis of CO₂ in Aprotic Media: Bridging Experiments and Simulations

Swantje Pauer (Karlsruhe Institute of Technology (KIT))

Dynamic Model-based Investigation of the 5-Hydroxymethylfurfural Oxidation and Ni(OH)₂ to NiOOH Transitions on Nickel Anodes

Jules Wolff (Unistra Strasbourg)

Cations effect on Pt(100) electrodes in aqueous solution studied by Molecular Dynamics at constant potentials

Felix Ehrlich (Karlsruhe Institute of Technology (KIT))

Predicting electrostatic equilibrium potentials in mixed conductor cells

Eva Fensterle (Zentrum für Sonnenenergie- und Wasserstoff-Forschung (ZSW))

Modified species equation in OpenFOAM to improve the description of species diffusion in porous media

Paul Feurstein (EPFL)

Modeling Charge Carrier Transfer in Photoanodes

Xin Shen (University of Strasbourg)

Microkinetic Modeling of Oxygen Evolution Reaction on Ni-Fe Alloy Electrodes

Dieter Froning (Forschungszentrum Jülich GmbH)

Machine Learning for the Characterization of Porous Transport Layers

Yang Qiu (Wuhan University of Technology)

High-pressure PEM Water Electrolysis – Effects of Compression and Operating Pressure

Linus Hammacher (Forschungszentrum Jülich GmbH)

Elucidating Parasitic Currents in Proton-Exchange Membrane Electrolytic Cells Via Physics-based and Data-driven Modeling

Violeta Karyofylli (Forschungszentrum Jülich GmbH)

Predictive modeling of proton-exchange membrane electrolytic cells

Artur Braun (Empa)

Proton-phonon coupling, and causality of lattice vibration and proton conductivity in solid electrolytes

Florian Altmann (TU Wien)

A numerically highly efficient dynamic quasi-2D PEMFC model including non-isothermal and phase change processes

Pedro Henrique Affonso Nóbrega (PSL University)

A new generation zero-dimensional physics-based model for proton-exchange membrane fuel cells

Lukas König (Zentrum für Sonnenenergie- und Wasserstoff-Forschung (ZSW))

Revisiting the Gas Diffusion Layer Water Inventory – Benchmarking Leverett

Jamil Kharrat (Karlsruhe Institute of Technology (KIT))

Influence of the Energy Management System in Fuel Cell-Battery Hybrid Powertrains on the operation of PEM fuel cells

Tobias Schmitt (Robert Bosch GmbH)

Bridging the Gap: Investigating the Influence of Clamping Pressure and performance in Full-Size PEM Fuel Cells

Edoardo Scoletta (ZHAW)

A Modelling Framework for the Simulation of Coupled Performance-Degradation Phenomena in Proton Exchange Membrane Fuel Cells

Sarah Hoffmann (Karlsruhe Institute of Technology (KIT))

Enhancing Gas Diffusion Layer Design: Integrating Simulation and Experimental Methods for Improved Gas Flow in PEM Fuel Cells

Bhanu Seth (Karlsruhe Institute of Technology (KIT))

Simulative fuel cell spatial behavior analysis for enhanced fuel cell control

Theresa Uhlemayr (Zentrum für Sonnenenergie- und Wasserstoff-Forschung (ZSW))

Performance Modeling of PEM fuel cells under consideration of electrochemical aging effects

Yuze Hou (Fraunhofer ISE)

Pore-Scale Investigation of Ordered Mesoporous Carbon Supported Catalyst in Proton Exchange Membrane Fuel Cells

Felix Benz (Forschungszentrum Jülich GmbH)

Mechanical Interaction Between Microporous Layer and Fiber Substrate in Gas Diffusion Layers for PEM Fuel Cells

Yann Bultel (University Grenoble Alpes)

Experimental investigation of Freeze/thaw cycle in Proton Exchange Membrane Fuel Cell

Ann Chantal Goutier (Paul Scherrer Institute)

Simulations on Electrode Placement for Non-Invasive Localized Impedance Measurements of Polymer Electrolyte Fuel Cells

Barbara Thiele (Paul Scherrer Institute)

Multi-scale Wettability Determination in Gas Diffusion Layers of Polymer Electrolyte Fuel Cells

Margherita Bulgarini (Politecnico di Milano)

Extension of an OpenFOAM CFD framework for the simulation of PEM fuel cell at the channel scale

Marine Cornet (University Grenoble Alpes)

A spatially averaged pseudo-3D model for analyzing operating heterogeneities in large PEM fuel cells

Philipp Oppek (Karlsruhe Institute of Technology (KIT))

Impedance-based Analysis of Water Transport Processes in a Segmented PEMFC

Mojtaba Barzegari (Technical University of Eindhoven (TU/e))

Volume-averaged electrochemical modeling and topology optimization for pattern-making on porous electrodes for redox flow batteries

Jinho Ha (Yonsei University)

Surrogate Model-based Parameter Estimation of Physics-based Model for Vanadium Redox Flow Batteries

Felipe Huerta (Pontificia Universidad Católica de Chile)

brinkmanPisoFoam – an open-source CFD software to model reactive flow in porous media relevant to redox flow batteries

Catalina Pino-Muñoz (Imperial College London)

Interfacial Mass Transfer Analysis of an Electrolyte through Free and Porous Media in a Flow-By Configuration

Steffen Zappe (University of Bayreuth)

Unveiling the Deposition Dynamics in Hybrid All-Fe Redox Flow Batteries based on kinetic Monte-Carlo Simulations

Marius Müller (Robert Bosch GmbH)

Impact of temperature dependent kinetic parameters on overpotential distributions in solid oxide cells

Philipp Blanck (Karlsruhe Institute of Technology (KIT), EIfER)

Electrochemical ammonia synthesis on an iron based electrode and a $\text{BaCe}_{0.7}\text{Zr}_{0.2}\text{Y}_{0.1}\text{O}_{3-\delta}$ membrane

Oscar Furst (Karlsruhe Institute of Technology (KIT))

Multiscale Simulation of a Solid Oxide Electrolysis Cell Stack: Evaluating the Influence of a Manifold on the Performance

Martin Deichelbohrer (Karlsruhe Institute of Technology (KIT))

Evaluation of Cell Housing Designs for Pressurized Testing of Solid Oxide Single Cells

Daniel Esau (Karlsruhe Institute of Technology (KIT))

2D FEM model for simulation of high temperature steam and co- electrolysis with a nickel/MIEC cermet electrode

Cedric Grosselindemann (Karlsruhe Institute of Technology (KIT))

Pressurized Testing and Modeling of Solid Oxide Single Cells

Khaled Lawand (EPFL)

3D Segmentation and Characterization of Solid Oxide Cells

Yanyu Chen (Forschungszentrum Jülich GmbH)

CFD-Based Mesoscale Simulation of Triple Phase Boundary Effects on Solid Oxide Cells Performance

Niklas Eyckeler (Forschungszentrum Jülich GmbH)

Unraveling Performance Decay in Solid Oxide Electrolysis Cells: Laying the Groundwork for Experiment-Driven Modeling Approaches

Bing Ni (German Aerospace Center (DLR))

Model-Based Analysis of Hydrogen Supply in Integrated PEM Fuel Cell/Liquid Hydrogen Tank Systems for Aviation Application

Diamantis Almpantis (Lunds University)

Integrated Optimization of PEM Electrolyzer and BoP Dynamics: Demand-Based Hydrogen Production and Storage Using Solar, Grid, and Hybrid Energy Strategies

Xiaolu Wang (North China Electric Power University)

A homogenized modeling approach for heat transfer-flow coupling in stacked structures

Ladislav Schönfeld (Technische Universität München)

CFD Simulation of Novel Spacer Designs for Membrane Humidifiers and Experimental Validation

Martin Gay (EPFL)

Impact of system efficiency maximization on an SOFC inside a hybrid SOFC + mGT system

B. Energy Storage

Adrian Lindner (Karlsruhe Institute of Technology (KIT))

Cracking Induced Degradation Phenomena in Garnet-Type All-Solid-State-Batteries

Maximilian Luczak (Math2Market GmbH)

Pathway towards a Validated Simulation Model for All-Solid-State Batteries

Felix Kullmann (Karlsruhe Institute of Technology (KIT))

Optimization of multiphase electrodes in all-solid-state batteries by physicochemical impedance modeling

Luigi Jacopo Santa Maria (University of Giessen)

Understanding the Relationship between Microstructure and Charge Transport Properties for Sodium Solid-State Batteries: A Focus on Cathode Composite Optimization

Maximilian Luczak (Math2Market GmbH)

Digital Modelling of Mercury Injection Capillary Pressure in Fuel Cells with a Multi-scale Model

Noah Lettner (German Aerospace Center)

A Thermodynamically Consistent Continuum Model for Ion-Selective Membranes in Aqueous Batteries

Kyunghyun Kim (Samsung SDI)

Understanding LiFePO₄ Battery Through Charging Dynamics and Electrochemical Modeling

Andreas Schiller (Fluxim AG)

Physics-Based Modelling of Operando Electrical Impedance Spectroscopy for the Characterization of Lithium-Ion Batteries

Ahmad Azizpour (Johannes Kepler University Linz)

Modelling Aging and Capacity Fade in graphite/NCA LIB: An Extended 1D Finite Element Approach with Particle Distribution Effects

Tim Laufer (Karlsruhe Institute of Technology (KIT))

Cracking and large deformations inside battery active particles

Nikolai Erhardt (Karlsruhe Institute of Technology (KIT))

A Novel Design of Physics-Informed Neural Networks for Modeling Mechanical Degradation in Active Materials with Phase Separation

Adrien Najjar-Giudicelli (Univ. Grenoble Alpes)

Diagnosis and Data Analysis of Aging Patterns for Second Life Applications of Electric Vehicle Batteries

Kawa Manmi (University of Warwick)

Comparing Common Zero-dimensional SEI Models Under Varied Conditions

Anastasia Efthymiadou (Paul Scherrer Institute)

Diagnostic protocol development for rapid SOH assessment for LFP/LMFP battery chemistries

Marek Sedlařík (Brno University of Technology)

Predictive Analysis and Data-Driven Modeling for Electrochemical Degradation of Li-ion Batteries

Philipp Benjamin Kuhn (University of Stuttgart)

Simulation of NMC cathode particle fracture based on the multiphase-field method

Haijun Ruan (Coventry University)

Explainable AI enabled advanced diagnostics for decoupling & quantifying energy-dense battery degradation modes

Monica Marinescu (Imperial College London)

The importance of degradation mode analysis in parametrising lifetime prediction models

Julian Ulrich (Karlsruhe Institute of Technology (KIT))

Your Charge Transfer Coefficient is not simply 0.5: Insights into Kinetics of Lithium-Ion-Batteries

Aravind Unni (Karlsruhe Institute of Technology (KIT))

KMC Simulation Study of SEI Formation from LiFSI/DME electrolyte in Li-Metal Battery

Rene Windiks (Materials Design s.a.r.l.)

Unravelling Reaction Mechanisms in Liquid Electrolytes of Lithium-Ion Batteries to Calculate Thermochemical-Kinetic Parameters

Jürgen Fuhrmann (Weierstrass Institute Berlin)

LiquidElectrolytes.jl - A Generalized Poisson-Nernst-Planck solver written in Julia

Franz Pichler (Virtual Vehicle Research GmbH)

A Novel Particle State Distribution Framework for Modeling Hysteresis in Batteries

Jorge Valenzuela (Karlsruhe Institute of Technology (KIT))

Thermochemical-Kinetic Insights into the Thermal Degradation Mechanisms of Lithium-Ion Batteries through Gas Analysis Modeling

Albert Pool (German Aerospace Center (DLR))

Quantum algorithms to solve partial differential equations in battery modelling

Leonie Pfeifer (Karlsruhe Institute of Technology (KIT))

Investigation of the influence of different thermal aging conditions on the thermal transport properties and porosity of lithium-ion battery electrodes

Raphael Mühlfort (Karlsruhe Institute of Technology (KIT))

Investigation of crucial effective transport parameters of Li-ion cells based on experimental impedance spectroscopy by a hybrid simulation model

Marc Schiffler (Karlsruhe Institute of Technology (KIT))

Modeling of Local Pressure Inhomogeneities in Large Format Lithium-Ion Batteries Using a Thermal-Mechanical Multi-Scale-Multi-Domain Model

Pascal Willer (Universität Stuttgart)

Development of a Physics-Based Electrochemical and Thermal Model of Li-Ion Batteries for Microcontroller Applications

Caroline Willuhn (Technische Universität Braunschweig)

Analysis of DEM-calendered anode microstructure for electronic and ionic conductivity

Jan Lammel (Fraunhofer ITWM)

Fully coupled three-dimensional electrochemical and thermal simulation of cylindrical lithium-ion battery cells

Dharshannan Sugunan (Imperial College London)

Modelling Voltage Hysteresis in Silicon-Based Anodes and LFP Cathodes Using PyBaMM

Jakub Jambrich (Karlsruhe Institute of Technology (KIT))

Investigation of LTO anodes as a reference for EIS and NFRA measurements

Michael Schönleber (Batemo GmbH)

Beyond Data Correlation: Understanding and Predicting Battery Aging with Fast, Physical and Accurate Models

Emir Gumrukcuoglu (University of Portsmouth)

Fast Inference of Physics-Based Models with Surrogate Neural Networks

Hossein Harimi (Bayreuth University)

Investigating Image Processing for Determining Geometrical Parameters of P2D Battery Models and Its Influence on Model Validity

Christoph Lechner (AVL List GmbH)

Enhanced Virtual Upscaling - From Battery Cell to Module with Smart Sensor Measurements

Paula Lorson (Karlsruhe Institute of Technology (KIT))

Modelling the discharge behaviour of battery cells with phase-separating active materials on the example of LFP

Francisco Fernandez (Laboratoire de Réactivité et Chimie des Solides)

Modeling the electrolyte wetting of a commercial NMC-Graphite 18650 cell

Simon Schwab (Offenburg University of Applied Sciences)

Electrochemical and mechanical behavior of a lithium-ion cell with a silicon-graphite negative blend electrode

Jinho Ha (Yonsei University)

Dual Particle Model with Electrolyte for Lithium-ion Batteries with Silicon/Graphite Negative Electrodes

Jonas Braun (Offenburg University of Applied Sciences)

Integration of lithium-ion batteries in a micro-photovoltaic system: Demonstration of an active charging system

Andreas Graule (Technische Universität München)

Development and Evaluation of a Physicochemical Equivalent Circuit Model for Lithium-Ion Batteries

Filiz-Pinar Seren (Karlsruhe Institute of Technology (KIT))

Growth Mechanisms of Lithium Metal Dendrites Revisited

Elia Zonta (Technical University of Munich)

Time-Dependent Global Sensitivity Analysis of the Doyle-Fuller-Newman Model

Will Clarke (University of Portsmouth)

A Reduced Order Model of Physics-Based Hysteresis in Lithium Iron Phosphate Electrodes

Sascha Stallmann (Fraunhofer IFAM)

A Novel Energy-Based High-Fidelity Multiphysical Model for Robust Simulations Across a Wide Range of Electrolyte Concentrations

John Mugisa (German Aerospace Center)

Collaborative experimental-computational workflows for accelerated parameterization of battery models

Laura Femmer (German Aerospace Center)

Continuum Modeling of Ca-based Batteries

Alexandra Pamperin (Karlsruher Institut für Technologie (KIT))

Influence of intragranular cracks on effective transport properties of granular cathode material using homogenization

Paige Brimley (EPFL)

Understanding ion-specific interactions in anion-exchange membranes via atomistic modeling

Huy Nguyen (Ulm University)

The change of Na storage mechanism from Soft Carbon to Hard Carbon

Elisabeth Oldenburg (Karlsruhe Institute of Technology (KIT))

Model-based Characterization of Aging in Sodium-Ion Batteries

Paul Maidl (German Aerospace Center (DLR))

Extending multi-scale simulations of sodium-ion batteries

Alexander Ruth (AVL List GmbH)

DoE Supported Parameterization of a Five Equation Pseudo Chemical Battery Thermal Runaway Model

Pamella Palmeira de Araújo (Lund University)

A Review of Coupled Numerical Modelling of Heat Transfer and Flame Propagation in Batteries

Didier Buzon (University Grenoble Alpes)

Thermal runaway Li-ion batteries modelling: Gen-3 and Gen-4 case studies comparison

Alastair Hales (About:Energy and University of Bristol)

Overcoming Thermal Modelling Challenges in Cylindrical and Prismatic Cells

ModVal 2025 Organizing Committee



Prof. Dr.
Wolfgang Bessler



Prof. Dr.-Ing.
Marc Kamlah



Dr.-Ing.
Philipp Seegert



Dr.-Ing.
André Weber



Prof. Dr.-Ing.
Thomas Wetzel

Institute of
Sustainable
Energy Systems
(INES)

Offenburg
University of
Applied Sciences
(HSO)

Institute for
Applied Materials
– Mechanics of
Multifunctional
Materials and
Structures
(IAM-MMI)

Karlsruhe
Institute of
Technology
(KIT)

Institute of
Thermal Process
Engineering
(TVT)

Karlsruhe
Institute of
Technology
(KIT)

Institute for
Applied Materials
– Electrochemical
Technologies
(IAM-ET)

Karlsruhe
Institute of
Technology
(KIT)

Institute of
Thermal Process
Engineering
(TVT)

Karlsruhe
Institute of
Technology
(KIT)

Conference Venue

GenoHotel Karlsruhe

Phone: +49 721 9898-0

Email: hotel@genohotel-karlsruhe.de

Homepage: <https://www.genohotel-karlsruhe.de/en>

Location: Am Rüppurrer Schloss 40, 76199 Karlsruhe, Germany
(<https://www.genohotel-karlsruhe.de/en/arrival-contact>)