

P R O G R A M

13th INTERNATIONAL **MODELICA** CONFERENCE

March 4–6, 2019

Ostbayerische Technische
Hochschule Regensburg, Germany

Chair: Prof. Anton Haumer



OSTBAYERISCHE
TECHNISCHE HOCHSCHULE
REGENSBURG



PREFACE

The Modelica Conference is the main event for users, library developers, tool vendors and language designers to share their knowledge and learn about the latest scientific and industrial progress related to Modelica and to the Functional Mockup Interface.

Since the start of the collaborative design work for Modelica in 1996, Modelica has matured from an idea among a small number of dedicated enthusiasts to a widely accepted standard language for the modeling and simulation of cyber-physical systems. In addition, the standardization of the language by the non-profit organization Modelica Association enables Modelica models to be portable between a growing number of tools. Modelica is now used in many industries including automotive, energy and process, aerospace, and industrial equipment. Modelica is the language of choice for model-based systems engineering.

Highlights of the Conference:

- 76 oral presentations and 13 poster presentations, 4 libraries for the Modelica Library Award
- 2 Keynotes
- 7 Tutorials and 2 Industrial User Presentations Sessions
- 14 vendor sessions and 17 sponsors & exhibitors

CONFERENCE BOARD

- Prof. Anton Haumer, OTH Regensburg, Germany
- Dr. Hilding Elmqvist, Mogram, Sweden
- Prof. Peter Fritzson, Linköping University, Sweden
- Prof. Martin Otter, DLR, Germany
- Dr. Michael Tiller, Xogeny, USA

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WELCOME



Prof. Anton Haumer
OTH Regensburg, Germany
Conference Chair

I warmly welcome you to Regensburg, a city with history going back to Roman times, and to OTH the Technical University of Applied Sciences Regensburg. Starting with this conference, you will notice some changes: First, we are going to organize the International Modelica Conference every two years in spring. In the years between International Modelica Conferences, Modelica Conferences are organized on other continents with country specific focus.

Although in 2018 there have been two very successful conferences in Japan and in the United States, we received 101 submissions from authors all over the world which have been thoroughly reviewed: 76 oral presentations and 13 posters will be presented.

Second, additional to the tutorials and vendor presentations on the first day of the conference, we are going to have Industrial User Presentations related to the Modelica Association Projects. These presentations are not included in the proceedings, but they should provide a nucleus for discussions and broadening the users groups.

I want to thank the members of the Program Committee for their work during the review process, as well as the members of the Organizing Committee – without their support this conference wouldn't have been a success.

MODELICA NEWS



Prof. Martin Otter
DLR, Wessling, Germany
Chair of the Modelica Association

In the name of the Modelica Association that is co-organizing this event, I also would like to welcome you in Regensburg. It is now already the 13th conference on Modelica, the Functional Mockup Interface and related technology. Since the number of projects and standards of the Modelica Association is growing, we would like to give you an overview about the current status in the traditional "Modelica Association News" section on Tuesday morning: All the Modelica Association Project leaders will give a short overview about their project and about their future plans.

KEYNOTE SPEAKERS



Modelica and virtual education

Dr. Christian Kral
TGM, Vienna, Austria

Abstract: Good education of engineering students requires theoretical knowledge and lots of calculation experience to better understand theory and applications. Laboratory courses are offered to better relate theory and practical understanding. Simulations even more improve the linking of theory and practice, as systemic thinking is supported. Students learn to understand the interaction of simple models and more advanced systems.

In the keynote speech two virtual education scenarios in engineering will be presented: First, a workflow of creating and evaluating calculation and simulation examples is proposed. The workflow is based on Modelica and the online tool Letto. Second, virtual lab experiments of electric machines and drives are shown. In the virtual lab Modelica variables are controlled and visualized by Labview. The presented approaches are possible steps in the direction of virtual education to improve and strengthen the students' expertise and knowledge and with the particular intention to motivate students.

Bio: Christian Kral received the diploma and doctoral degrees from the Vienna University of Technology, Vienna, Austria, in 1997 and 1999, respectively. From 1997 to 2000, he was a Scientific Assistant in the Institute of Electrical Drives and Machines, Vienna University of Technology. Since 2001, he has been with the AIT Austrian Institute of Technology GmbH (the former Arsenal Research) in Vienna. From January 2002 until April 2003, he was a Visiting Professor at the Georgia Institute of Technology, Atlanta. Dr. Kral is teaching electric machines and drives at the higher college of engineering »TGM« in Vienna and the university of applied research, »Technikum Wien« since 2013. His research interests include the modeling and simulation of electrical systems, machines and drives. He is a member of the Austrian Electrotechnical Association (OVE) and the Modelica Association. Dr. Kral published over 150 scientific papers and one book on Modelica and the object oriented modeling of electric machines.



Simulation Guided Design for New Automotive Applications

Dr. Gerd Rösel
Continental, Regensburg, Germany

Abstract: The Automotive Industry has to cope with disruptive technology and business changes within the next decade. Connected vehicles become reality and drive the development to automated driving. New mobility solutions will have to answer shared economy demands. The regulatory requirement on significant reduction of CO₂- and pollutant emission leads to fast changing parallel development of additional propulsion systems in the same period. Consequently, the variety of solutions within a vehicle will have to serve a furthermore increasing complexity from embedded-systems to system-of-systems to cyber-physical-systems.

Simulation guided design is the key to handle such complexity in all areas of application for an automotive supplier to keep quality, time to market and costs under control. The speech covers the main directions of disruptive technology changes and examples of dedicated solutions. There will be examples given which cover virtual function development for embedded systems as well as solutions for predictive maintenance and connected energy management as system-of-systems. The focus will be to point out the necessity to design and optimize such systems by simulation.

Bio: Dr. Gerd Rösel is heading the departments Advanced System Engineering for Engine Systems (since 2015) as well as Hybrid Electric Vehicle Business Unit (since 2018) for Continental Powertrain. The application and further development of simulation methodologies is a significant building block in these responsibilities. The variety in simulation technology covers propulsion system simulation as well as specialized simulation in areas like electric machines, mixture formation and NVH.

From 1996 until 2015 he has been responsible in different positions for Gasoline- and Diesel-System-Development for serial and advanced applications. From 1992 to 1997 he was a research associate at Technical University of Dresden and finished with the graduation of Dr.-Ing. in 1997. The Diploma degree in electrical engineering from Technical University of Dresden was achieved in 1992.

GENERAL SCHEDULE

S054 | floor 1

S051 | floor 0

S053 | floor -1

S052 | floor 0

Monday, March 4

13:00 – 16:30 Industrial User Presentations and Tutorials

16:30 – 17:00 Coffee Break

17:00 – 19:15 Vendor Sessions

19:15 – 19:30 Short Break

19:30 Welcome Reception

Tuesday, March 5

09:00 – 09:15 Welcome

09:15 – 09:45 Modelica News

09:45 – 10:30 Keynote 1: Dr. Christian Kral, Vienna, Austria
Modelica and virtual education

10:30 – 11:00 Coffee Break

11:00 – 12:15 Session 1A: Buildings 1 Session 1B: Power&Energy 1 Session 1C: FMI 1 Session 1D: Automotive 1

12:15 – 13:45 Lunch

13:45 – 15:00 Session 2A: Buildings 2 Session 2B: Power&Energy 2 Session 2C: FMI 2 Session 2D: Electrical Power 2

15:00 – 15:30 Coffee Break

15:30 – 17:00 Postersession | Forum Building K

17:00 – 18:40 Session 3A: HVAC Session 3B: Language S. 3C: Mechanics&Transport Session 3D: New Applications

18:40 – 20:00 Transfer to Dinner Location

20:00 Conference Dinner at the Castle of Emmeram

Wednesday, March 6

08:30 – 09:15 Keynote 2: Dr. Gerd Rösel, Regensburg, Germany
Simulation Guided Design for New Automotive Applications

09:15 – 09:30 Short Break

09:30 – 10:45 Session 4A: Power&Energy 3 Session 4B: Automotive 2 Session 4C: Aerospace Session 4D: Numerical Methods

10:45 – 11:15 Coffee Break

11:15 – 12:30 Session 5A: Buildings 3 Session 5B: Power&Energy 4 Session 5C: Thermodynamic 1 Session 5D: Electrical Power 2

12:30 – 14:00 Lunch

14:00 – 15:15 Session 6A: Buildings 4 Session 6B: Thermodynamic 2 Session 6C: Tools Session 6D: Automotive 3

15:15 – 15:30 Short Break

15:30 – 15:45 Closing Session

PROGRAM – MONDAY AFTERNOON

■ S054 floor 1
 ■ S051 floor 0
 ■ S053 floor -1
 ■ S052 floor 0
 ■ S057 floor 0
 ■ S059 floor 0
 ■ S157 floor 1
 ■ S159 floor 1
 ■ S101 floor 1
 ■ S103 floor 1

13:00 – 16:30 Industrial User Presentations and Tutorials

13:00 – 16:30	Industrial User Presentations FMI+DCP+SSP	Industrial User Presentations LANG+LIB	Tutorial Livio Mariano / Altair Connecting Separated Worlds for True Multidisciplinary System Simulation – by Using Altair Activate™	Tutorial Peter Fritzson / OSMC et al Introduction to Modeling, Simulation, Debugging, and Julia Interoperability with Modelica and OpenModelica
13:00 – 16:30	Tutorial Thomas Beutlich / ESI Group Creating and Working with Modelica-State-Machines	Tutorial Edmund Widl / AIT The FMI++ Python Interface: A Python package for importing and exporting FMUs	Tutorial Lennart Ochel and Robert Braun / OSMC Introduction to FMI including Model-Exchange and Co-simulation, SSP, and Graphic Editing of Composite FMI Models	Tutorial Torsten Sommer / Dassault Systemes Hacking FMI
13:00 – 16:30				Tutorial Andreas Heckmann / DLR Modeling and Simulation of Railway Dynamics in Modelica

16:30 – 17:00 Coffee Break

17:00 – 19:15 Vendor Sessions

17:00 – 17:45	Altair Michael Hoffmann Altair's Open Integration Platform for Multi-Disciplinary System Simulation	ESI Group Alex Magdanz SimulationX 4.0: What's new?	OSMC Peter Fritzson et al OpenModelica Status and News	Modelon Jiri Navrátil and Johan Windahl Making an Impact with Modelica and FMI	Monentia Jose Juan Hernandez Cabrera Dacosim NG: co-simulation made simpler and faster
17:45 – 18:30	Dassault Systemes Dag Brück et al Recent updates and candidate directions for development in Dymola and 3DEXPERIENCE	Wolfram Jan Bruggard Providing Modelica to millions of users	Maplesoft Thomas Richard MapleSim 2018 and Expanded FMI Support	Reseau de Transport d'Electricite RTE Adrien Guironnet et al Dynaoo, an open source hybrid C++/Modelica tool for power system simulations	Concurrent Ramesh Praveenkumar Running FMUs in real-time under Simulation Workbench (SimWB)
18:30 – 19:15	Siemens Bruno Lacabanne Combining Modelica models, FMUs and causal libraries in a same environment, Simcenter Amesim	Gaio Technology Koichi Saito The consideration and verification of FMI/FMU effective use on embedded software area	Claytex Mike Dempsey Modelica and FMI solutions from Claytex	Ansys Manzoor Tiwana ANSYS Twin Builder: Simulation based Digital Twin using Modelica	

19:15 – 19:30 Short Break

19:30 Welcome Reception

INDUSTRIAL USER PRESENTATIONS

FMI + DCP + SSP

Torsten Blochwitz, Andreas Junghanns,
Martin Krammer, Jochen Köhler
Overview over standards FMI + DCP + SSP

Dirk Frerichs, Giuseppe Maggi Trovato,
Samuel Lago Places and Karl Michael Hahn
**Quality Assurance through Management
of Model Meta Data**

Christian Bertsch
Usage of FMI at Bosch – status and outlook

Tim Schenk, Andr s Botero Halblaub
and Jan Christoph Wehrstedt
**Co-Simulation scenarios
in industrial production plants**

Magnus Eek and Robert H llqvist
**Enhancing the Model Integration Workflow
in Aircraft System Simulation
using FMI & SSP**

Nadja Marko, Hannes Schneider,
Andreas Biehn and Jonas R bsam
**Simulation of sensor models
for testing ADAS using DCP**

Juan Carlos Mendo, Borja Garc a
and Alejandro Torres
**Enabling Standardized Distributed
Co-Simulation at Boeing**

Andreas Soppa, Sinan Balci and Martin Benedikt
**DCP application use-cases
at Volkswagen AG**

LANG + LIB

Hans Olsson and Thomas Beutlich
**Status and further development of
Language and Libraries**

Mathieu Caujolle and Markus Andres
**Modeling and simulating hybrid distribution
networks with EPSL**

Manuel Gr ber, Jennifer Puschke, Tobias Hen ,
Eugen Dering, Andreas Pillekeit, Christian Schulze
**Physical Modeling of Heat Pumps for
Hardware-in-the-Loop Testing**

Jungdo Kee, Daeoh Kang, Kwang-Woo Lee
and Seung-Jin Heo
**Development of MODELICA based vehicle
dynamic model considering limited handling
for FAD controller**

Rafal Bryk, Holger Schmidt, Thomas Mull,
Ingo Ganzmann and Oliver Herbst
**Modeling of Self-Driven Processes in Passive
Safety Systems of III+ Generation BWR**

SCIENTIFIC PROGRAM – TUESDAY MORNING

■ S054 floor 1 ■ S051 floor 0 ■ S053 floor -1 ■ S052 floor 0

09:00 – 09:15	Welcome				
09:15 – 09:45	Modelica News				
09:45 – 10:30	Keynote 1: Dr. Christian Kral, Vienna, Austria Modelica and virtual education				
10:30 – 11:00	Coffee Break				
11:00 – 12:15					
	Session 1A: Buildings 1	Session 1B: Power&Energy 1	Session 1C: FMI 1	Session 1D: Automotive 1	
10:00 – 10:25	Raymond Sterling, Jesús Febres, Andrea Costa, Adeleh Mohammadi, Rafael Carrillo, Baptiste Schubnel, Yves Staufner, Pietro De Cinque, Krzysztof Klobut, Marcus Keane A virtual test-bed for building Model Predictive Control developments	Jovan Brkic, Muaz Ceran, Mohamed Elmoghazy, Anton Haumer, Christian Kral Open Source PhotoVoltaics Library for Systemic Investigations	Lennart Ochel, Robert Braun, Bernhard Thiele, Adeel Asghar, Lena Buffoni, Magnus Eek, Peter Fritzon, Dag Fritzon, Sune Horkeby, Robert Hällquist, Åke Kinnander, Arunkumar Palanisamy, Adrian Pop, Martin Sjölund OMSimulator – Integrated FMI and TLM-based Co-simulation with Composite Model Editing and SSP	Jakub Tobolar, Martin Leitner, Andreas Heckmann Anti-Roll Bar Model for NVH and Vehicle Dynamics Analyses	
11:25 – 11:50	Moritz Lauster, Dirk Müller Characterization of Linear Reduced Order Building Models Using Bode Plots	Mareike Leimeister Python-Modelica Framework for Automated Simulation and Optimization	Lars Ivar Hatledal, Houxiang Zhang, Arne Styve, Geir Hovland FMI-proxy: A Framework for Distributed Access to Functional Mock-up Units	James Jeffs, Andrew McGordon, Widanalage Dhammik Widanage, Simon Robinson, Alessandro Picarelli System level heat pump model for investigations into thermal management of electric vehicles at low temperatures	
11:50 – 12:15	Christoph Nytsch-Geusen, Jörg Rädler, Matthias Thorade, Carles Ribas Tugores BIM2Modelica – An open source toolchain for generating and simulating thermal multi-zone building models by using structured data from BIM models	Jörn Benthin, Annika Heyer, Philipp Huisman, Anne Hagemeyer, Klaus Görner Demand oriented Modelling of coupled Energy Grids	Martin Krammer, Klaus Schuch, Christian Kater, Khaled Alekeish, Torsten Blochwitz, Stefan Materne, Andreas Soppa, Martin Benedikt: Standardized Integration of Real-Time and Non-Real-Time Systems: The Distributed Co-Simulation Protocol	John Batteah, Ashok Kumar Ravi, Dale Pickelman Diesel Cooling System Modeling for Electrification Potential	
12:15 – 13:45	Lunch				

SCIENTIFIC PROGRAM – TUESDAY AFTERNOON

■ S054 floor 1 ■ S051 floor 0 ■ S053 floor -1 ■ S052 floor 0

13:45 – 15:00

Session 2A: Buildings 2	Session 2B: Power&Energy 2	Session 2C: FMI 2	Session 2D: Electrical Power 2
<p>Nadine Aoun, Roland Bavière, Mathieu Vallée, Adrien Brun, Guillaume Sandou</p> <p>Dynamic Simulation of Residential Buildings Supporting the Development of Flexible Control in District Heating Systems</p>	<p>Torsten Schwan, Ole Ziesler, Tom Eckhardt, Rene Unger</p> <p>A Modelica-Based Framework for District Heating Grid Simulation</p>	<p>Claire-Elleuthériane Gerrer, Sylvain Girard</p> <p>Non Linear Dimension Reduction of Dynamic Model Output</p>	<p>Alexander Grimm, Anton Haumer</p> <p>Parameterization of a Simplified Physical Battery Model</p>
<p>Filip Jorissen, Lieve Helsen</p> <p>Integrated Modelica Model and Model Predictive Control of a Terraced House Using IDEAS</p>	<p>Abdulahman Dahash, Annette Steingrube, Mehmet Elci, Fabian Ochs</p> <p>Optimization of District Heating Systems: European Energy Exchange Price-Driven Control Strategy for Optimal Operation of Heating Plants</p>	<p>Slaven Glumac, Zdenko Kovačić</p> <p>Relative Consistency and Robust Stability Measures for Sequential Co-simulation</p>	<p>Mads Nannestad, Benoit Bidoggia, Zhe Zhang, Tiberiu-Gabriel Zsurzsan, Kasper Skriver</p> <p>Modeling of transformer-rectifier sets for the energization of electrostatic precipitators using Modelica</p>
<p>Scott Bortoff, Christopher Laughman</p> <p>An Extended Luenberger Observer for HVAC Application using FMI</p>	<p>Michael Mans, Tobias Blacha, Peter Remmen, Dirk Müller</p> <p>Automated model generation and simplification for district heating and cooling networks</p>	<p>Kenji Sawada, Mamoru Sakura, Osamu Kaneko, Seiichi Shin, Isao Matsuda, Toru Murakami</p> <p>Energy balance based Verification for Model Based Development</p>	<p>Alberto Romero, Alejandro Goldar, Emanuele Garone</p> <p>A Model Predictive Control Application for a Constrained Fast Charge of Lithium-ion Batteries</p>

15:00 – 15:30 Coffee Break

15:30 – 17:00 Postersession | Forum Building K

POSTER SESSION – TUESDAY – FORUM BUILDING K

15:30 – 17:00

Hans Olsson
.....

**Flow Network based
Diagnostics for Incorrect
Synchronous Models**

Masatomo Inui,
Tomohisa Fujinuma
.....

**Study on Efficient Development
of 1D CAE Models of Mechano-
Electrical Products**

Jan-Peter Heckel,
Christian Becker
.....

**Advanced Modeling of Electric
Components in Integrated
Energy Systems with the
TransiEnt Library**

Andreas Nicolai, Anne Paepcke,
Hauke Hirsch
.....

**Robust and accurate co-simulation
master algorithms applied
to FMI slaves with discontinuous
signals using FMI 2.0 features**

Yutaka Watanabe,
Toru Takahashi
.....

**Development of a General-
purpose Analytical Tool for Eva-
luating the Dynamic Characte-
ristics of Thermal Energy Systems**

Jose Evora, Jose Juan Hernandez
Cabrera, Jean-Philippe Tavella,
Stéphane Vialle, Enrique Kremers,
Loïc Frayssinet
.....

**Daccosim NG: co-simulation
made simpler and faster**

Atiyah Elsheikh
.....

**der(x,p) !? Applications
and Computational Methods
of Dynamic Parameter
Sensitivities**

Bingrui Bao, Junfeng Guo,
Baokun Zhang, Fanli Zhou
.....

**Frequency Response Estimation
Method for Modelica Model
and Frequency Estimation
Toolbox Implementation**

Yangyang Fu, Xing Lu,
Wangda Zuo
.....

**Modelica Models for the
Control Evaluations of
Chilled Water System with
Waterside Economizer**

Sooncheol Park, Yonggwon Jeon,
Dae-Oh Kang, Min-Su Hyun,
Seung-Jin Heo
.....

**Predicting the vehicle
performance at an early stage
of development process via
suspension bush design tool**

Yuhui Liu, Liping Chen,
Yan Zhao, Shanshan Liu,
Fanli Zhou, Duansen Shangguan
.....

**Modelica-Based Modeling and
Application Framework on the
Hybrid Electric Vehicles**

John Webster, Carsten Bode
.....

**Implementation of a
Non-Discretized Multiphysics
PEM Electrolyzer Model
in Modelica**

Jean-Philippe Chancelier,
Sébastien Furic, Pierre Weis
.....

**Translating Simulink Models
to Modelica using the {\NSP}
Platform**

SCIENTIFIC PROGRAM – TUESDAY EVENING

■ S054 floor 1 ■ S051 floor 0 ■ S053 floor -1 ■ S052 floor 0

17:00 – 18:40

Session 3A: HVAC	Session 3B: Language	Session 3C: Mechanics&Transport	Session 3D: New Applications
<p>Rohit Dhumane, Jiazhen Ling, Vikrant Aute, Reinhard Radermacher Modeling Heat Pump Recharge of a Personal Conditioning System with Latent Heat Storage</p>	<p>Christoff Bürger Modelica language extensions for practical non-monotonic modelling: on the need for selective model extension</p>	<p>Andreas Heckmann, Marc Ehret, Gustav Grether, Alexander Keck, Daniel Lüdicke, Christoph Schwarz DLR RailwayDynamics Library</p>	<p>Michael Tiller Modeling Supply and Demand in Modelica</p>
<p>Wenji Wang, Yaoyu Li Real-time optimization of intermediate temperature for a cascade heat pump via extreme seeking</p>	<p>Peter Fritzon, Adrian Pop, Martin Sjölund, Adeel Asghar MetaModelica – A Symbolic-Numeric Modelica Language and Comparison to Julia</p>	<p>Scott Bortoff Using Baumgarte's Method for Index Reduction in Modelica</p>	<p>John Redford, Ana Bisinella, Jean-Philippe Saut, Jacques Robert, Maria Albuquerque, Jean-Pierre Merland, Jean-Michel Ghidaglia Modelica Modelling of an Ammonia Stripper</p>
<p>Zhenning Li, Hongtao Qiao, Vikrant Aute Tube-fin Heat Exchanger Circuitry Optimization For Improved Performance Under Frosting Conditions</p>	<p>Bernhard Thiele, Bernt Lie, Martin Sjölund, Adrian Pop, PeterFritzon Controller Design for a Magnetic Levitation Kit using OpenModelica's Integration with the Julia Language</p>	<p>Tatsuro Ishibashi, Tadao Kawai Modeling of Rotating Shaft with Partial Rubbing</p>	<p>Andrea Neumayr, Martin Otter Algorithms for Component-Based 3D Modeling</p>
<p>Hongtao Qiao, Saleh Nabi, Xu Han, Christopher Laughman Coupled Simulation of a Room Air-conditioner with CFD Models for Indoor Environment</p>	<p>Giovanni Agosta, Emanuele Baldino, Francesco Casella, Stefano Cherubin, Alberto Leva, Federico Terraneo Towards a High-Performance Modelica Compiler</p>	<p>Martin Kuhn, Yang Ji, Bo Wang, Xiang Li, Bohui Liu, Feng Sha, Dunwen Gan, Feng Gao Aspects of Train Systems Simulation</p>	<p>Jan Šilar, Filip Ježek, Arnošt Mládek, David Polák, Jiří Kofránek Model visualization for e-learning, Kidney simulator for medical students</p>
<p>17:00 – 17:25</p>			
<p>17:25 – 17:50</p>			
<p>17:50 – 18:15</p>			
<p>17:50 – 18:40</p>			
<p>18:15 – 18:40</p>			
<p>18:40 – 20:00 Transfer to Dinner Location</p>			
<p>20:00 Conference Dinner at the Castle of Emmeram</p>			

SCIENTIFIC PROGRAM – WEDNESDAY MORNING I

■ S054 floor 1 ■ S051 floor 0 ■ S053 floor -1 ■ S052 floor 0

08:30 – 09:15 **Keynote 2: Dr. Gerd Rösel, Regensburg, Germany | Simulation Guided Design for New Automotive Applications**

09:15 – 09:30 **Short Break**

09:30 – 10:45

Session 4A: Power&Energy 3 **Session 4B: Automotive 2** **Session 4C: Aerospace** **Session 4D: Numerical Methods**

Johan Windahl, Håkan Runvik,
Stephane Velut
**Platform for Microgrid Design
and Operation**

Romain Gillot, Alessandro Picarelli,
Mike Dempsey
**Fault Insertion for Controller
Calibration in a Range
of Engine Models**

Duansen Shangquan, Liping Chen,
Jianwan Ding, Yuhui Liu
**Modeling and Simulation of Dual
Redundant Electro-Hydrostatic
Actuation System with Special Focus
on model architecting and
multidisciplinary effects**

Erik Henningsson, Hans Olsson,
Luigi Vanfretti
**DAE Solvers for
Large-Scale Hybrid Models**

09:30 – 09:55

Carsten Bode, Gerhard Schmitz
**Influence of Excess Power Utilization
in Power-to-Heat Units
on an Integrated Energy System
with 100 % Renewables**

Nikolas Schröder, Oliver Lenord,
Ralph Lange
**Enhanced Motion Control
of a Self-Driving Vehicle Using
Modelica, FMI and ROS**

Max Arzberger, Dirk Zimmer
**A Modelica-based environment
for the simulation of hybrielectric
propulsion systems**

Rebeka Farkas, Gábor Bergmann,
Ákos Horváth
**Adaptive Step Size Control
for Hybrid CT Simulation
without Rollback**

09:55 – 10:20

Anh Nguyen, John Batteh
**Model-Based Controls Development
and Implementation for
a Hydroelectric Power System**

Artem Kolesnikov, Dzmitry Tretsiak,
Morgan Cameron
**Systematic Simulation of
Fault Behavior by Analysis
of Vehicle Dynamics**

Daniel Milz, Christian Weiser,
Franciscus van der Linden,
Matthias Hellerer, Andreas Seefried,
Tobias Bellmann
**Advances in Flight Dynamics Modelling
and Flight Control Design by Using
the DLR Flight Visualization and Flight
Instruments Libraries**

Christian Schulze, Andreas Varchmin,
Wilhelm Tegethoff
**Steady State Initialization of Vapor
Compression Cycles Using
the Homotopy Operator**

10:20 – 10:45

10:45 – 11:15 **Coffee Break**

SCIENTIFIC PROGRAM – WEDNESDAY MORNING II

■ S054 floor 1 ■ S051 floor 0 ■ S053 floor -1 ■ S052 floor 0

11:15 – 12:30

Session 5A: Buildings 3		Session 5B: Power&Energy 4		Session 5C: Thermodynamic 1		Session 5D: Electrical Power 2	
11:15 – 11:40	Hauke Hirsch, Andreas Nicolai, Hans Petzold Co-Simulation Through Exchange of Time-Series Data Applied to an Energy System Model and Detailed Ground Heat Exchanger Model	Luis Corona Mesa-Moles, Jean-Philippe Argaud, Audrey Jardin, Amine Benssy, Yulu Dong Robust Calibration of Complex ThermosysPro Models using Data Assimilation Techniques: Application on the Secondary System of a Pressurized Water Reactor	Dirk Zimmer Towards Hard Real-Time Simulation of Complex Fluid Networks	Biswarup Mukherjee, Luigi Vanfretti Modeling of PMU-Based Automatic Re-synchronization Controls for DER Generators in Power Distribution Networks using Modelica and the OpenIPSL			
	Queralt Altes-Buch, Sylvain Quoilin, Vincent Lemort Greenhouses: A Modelica Library for the Simulation of Greenhouse Climate and Energy Systems						
11:40 – 12:05		Yangyang Fu, Sen Huang, Draguna Vrabie, Wangda Zuo Coupling Power System Dynamics and Building Dynamics to Enabling Building-to-Grid Integration	Martin Otter, Hilding Elmqvist, Dirk Zimmer, Christopher Laughman Media and Fluid Modeling with Modern Programming Language Construct	Marcelo de C. Fernandes, Luigi Vanfretti, Janaina G. de Oliveira, Maxime Baudette A Fundamental Time-Domain and Linearized Eigenvalue Analysis of Coalesced Power Transmission and Unbalanced Distribution Grids using Modelica and the OpenIPSL			
	Ryan Rogers, Vickram Lakhian Modeling of Low Temperature Thermal Networks Using Historical Building Data from District Energy Systems	Tobias Ramm, Mathias Ehrenwirth, Tobias Schrag Modelling of the Central Heating Station within a District Heating System with Variable Temperatures	Maximilian Hebel, Christian Schulze, Wilhelm Tegethoff, Jürgen Köhler Simulative Potential Analysis of Combined Waste Heat Refrigeration using Ammonia in an Intercity Bus on dynamic route	Andrea Bartolini, Francesco Casella, Adrien Guironnet Towards Pan-European Power Grid Modelling in Modelica: Design Principles and a Prototype for a Reference Power System Library			
12:05 – 12:30							

12:30 – 14:00 Lunch

SCIENTIFIC PROGRAM – WEDNESDAY AFTERNOON

■ S054 floor 1 ■ S051 floor 0 ■ S053 floor -1 ■ S052 floor 0

14:00 – 15:15

Session 6A: Buildings 4	Session 6B: Thermodynamic 2	Session 6C: Tools	Session 6D: Automotive 3
<p>Bruno Hadengue, Andreas Scheidegger, Eberhard Morgenroth, Tove A. Larsen The WaterHub Modules: Material and Energy Flow Analysis of Domestic Hot Water Systems</p>	<p>Maximilian Kormann, Imke Lisa Krüger Application of a Real Gas Model by Van-der-Waals for a Hydrogen Tank Filling Process</p>	<p>Adrian Pop, Per Östlund, Francesco Casella, Martin Sjölund, Rüdiger Franke A New OpenModelica Compiler High Performance Frontend</p>	<p>Weitao Chen, Shenhai Ran, Bengt Jacobson Integration and Analysis of EPAS and Chassis System in FMIbased co-simulation</p>
<p>Anna Vannahme, Tobias Schrag, Mathias Ehrenwirth, Tobias Ramm Comparison of a usual heat-transfer-station with a hydraulic modified version under the aspect of exergy saving</p>	<p>Sukhwinder Singh, Gerhard Schmitz, Bodo Micken Modeling of the Flow Comparator Prototype as New Primary Standard for High Pressure Natural Gas Flow Metering</p>	<p>Bernt Lie, Arunkumar Palanisamy, Alachew Mengist, Lena Buffoni, Martin Sjölund, Adeel Asghar, Adrian Pop, Peter Fritzson OMJulia: An OpenModelica API for Julia-Modelica Interaction</p>	<p>Theodor Ensburry, Mike Dempsey, David Briant Virtual Proving Ground Testing: Deploying Dymola and Modelica to recreate Full Vehicle Proving Ground Testing Procedures</p>
<p>Anne Senkel, Carsten Bode, Gerhard Schmitz Evaluating the Resilience of Energy Supply Systems at the Example of a Single Family Dwelling Heating System</p>	<p>Tim Eller, Florian Heberle, Dieter Brüggemann Transient modelling and simulation of a double-stage Organic Rankine Cycle</p>	<p>Christian Vering, Sven Hinrichs, Moritz Lauster, Dirk Müller "hello, (Modelica) world": Automated documentation of complex simulation models exemplified by expansion valves</p>	<p>Franz Rudolf Holzinger, Martin Benedikt Hierarchical Coupling Approach Utilizing Multi-Objective Optimization for Non-Iterative Co-Simulation</p>
15:15 – 15:30 Short Break			
15:30 – 15:45 Closing Session			

SOCIAL PROGRAM

The Conference Dinner will take place on Tuesday, March 5, 2019, 20:00 in the riding hall of the Castle of Emmeram, Emmeramsplatz, Regensburg.

It is located in walking distance (approximately 2 km) from the Conference venue as well as from many hotels.

However, for your convenience we will provide a bus shuttle from the Conference venue to the Dinner location. We ask for your understanding that the bus can't stop at the hotels during this short ride. After the dinner, we provide a bus shuttle from the Dinner location at least to the recommended hotels:

<https://www.modelica.org/events/modelica2019/subpages/travellingaccomodation>



PRACTICAL INFORMATION

Application Access

Download from Google Play or App Store the application **Modelica 2019**.

Proceedings

They are available at **Modelica 2019 Proceedings Page**
<https://modelica.org/events/modelica2019/proceedings/Modelica2019Proceedings.html>
or in the application **Modelica 2019** for download.

WIFI Connection

Information about the free wireless Internet will be available at the Conference Registration desk.

Registration Desk

The registration desk is open from Monday March 4 2017 12:00 throughout the whole conference.

Parking

Visitors coming by car should use the A3 and A93 "Autobahnen". Take the "Universität/Klinikum" exit then follow the signs to "Universität/Fachhochschule". This takes you to Galgenbergstrasse. The car park is on Galgenbergstraße on the left hand side between the buildings of the University of Regensburg and OTH Regensburg.

Voltage

Electricity in Germany is 230 Volts, alternating at 50 Hertz. The used power sockets are 2 round pin plugs (Type C and E).

Emergency Numbers

112 – European Emergency Number
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For more information about Regensburg, please go to <http://www.tourismus.regensburg.de>

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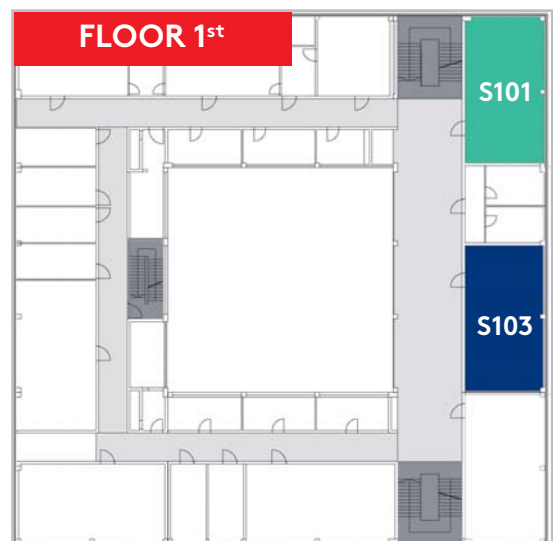
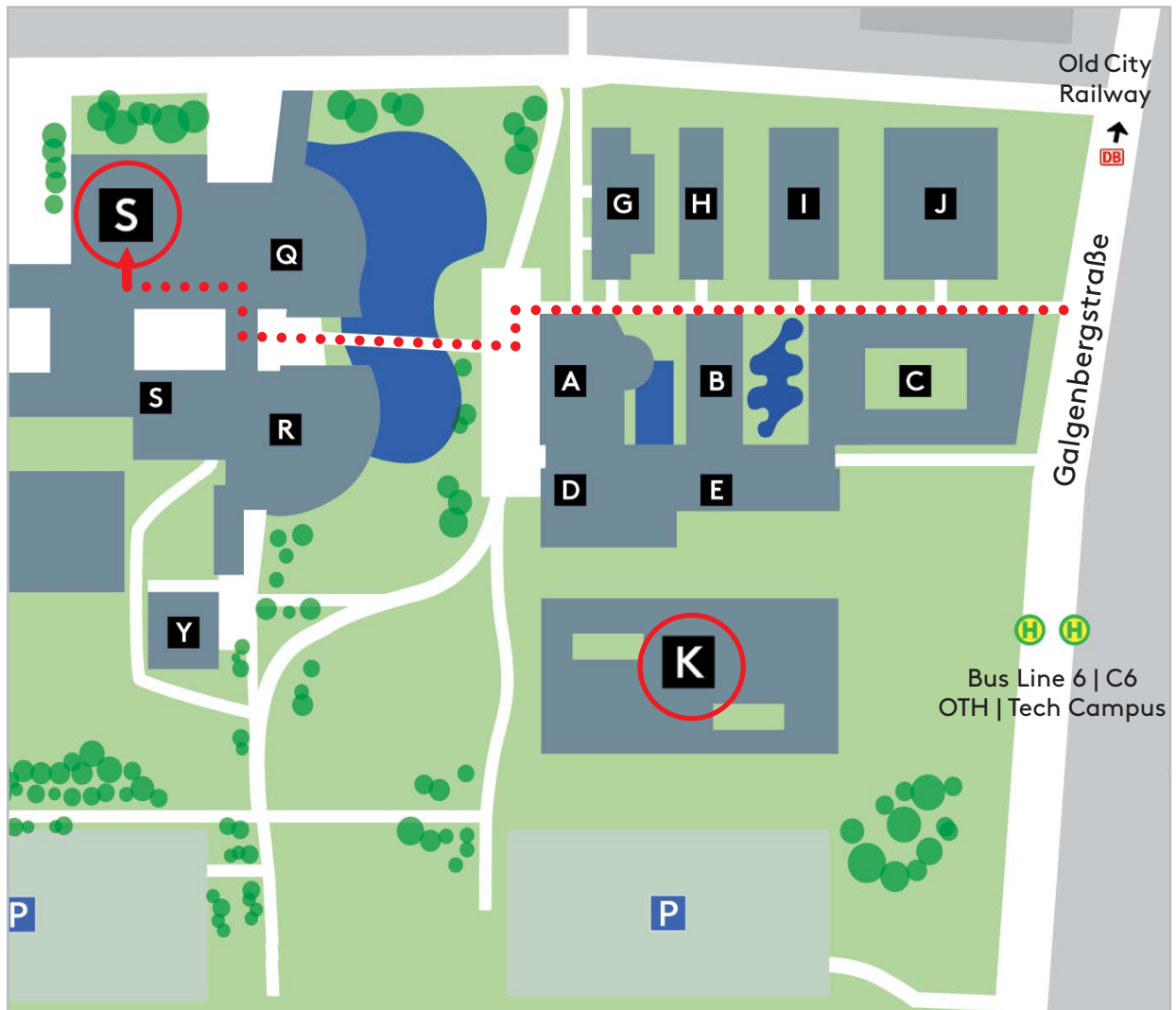
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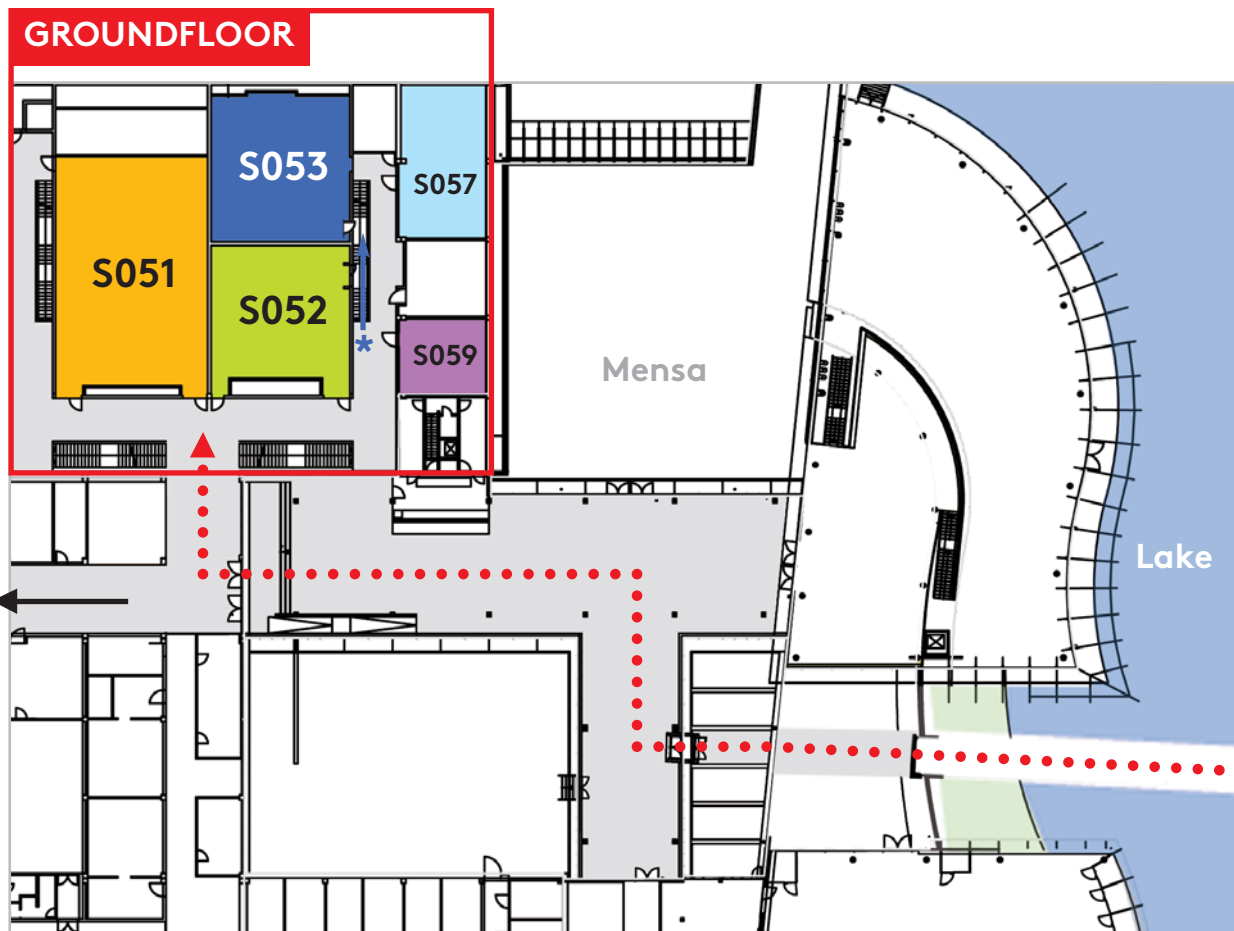
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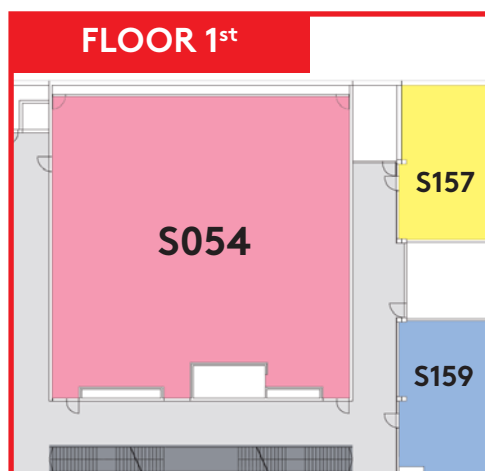


SITE PLAN



* to reach S053: some steps downstairs

* to reach S101 | S103: first staircase on the left



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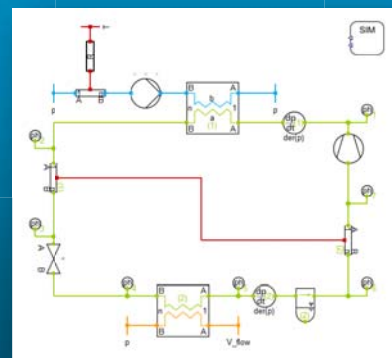
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