PROGRAM OF THE 13th INTERNATIONAL MODELICA CONFERENCE
March 4–6, 2019
Ostbayerische Technische Hochschule Regensburg, Germany
Chair: Prof. Anton Haumer
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

CONTENTS

Preface ........................................................................................................... 2
Welcome ....................................................................................................... 3
Modelica News ........................................................................................... 3
Keynote: Modelica and virtual education ................................................. 4
Keynote: Simulation Guided Design for New Automotive Applications .. 4
General Schedule ....................................................................................... 5
Schedule / Program .................................................................................... 6
Social Program ............................................................................................ 15
Practical Information .................................................................................. 15
Site Plan ....................................................................................................... 16
Sponsors & Exhibitors ................................................................................ 18
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.

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.
**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

**Program of the 13th International Modelica Conference | March 4-6, 2019 | OTH Regensburg, Germany**

## Monday, March 4

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00 – 16:30</td>
<td>Industrial User Presentations and Tutorials</td>
</tr>
<tr>
<td>16:30 – 17:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>17:00 – 19:15</td>
<td>Vendor Sessions</td>
</tr>
<tr>
<td>19:15 – 19:30</td>
<td>Short Break</td>
</tr>
<tr>
<td>19:30</td>
<td>Welcome Reception</td>
</tr>
</tbody>
</table>

## Tuesday, March 5

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 – 09:15</td>
<td>Welcome</td>
</tr>
<tr>
<td>09:15 – 09:45</td>
<td>Modelica News</td>
</tr>
<tr>
<td>09:45 – 10:30</td>
<td>Keynote 1: Dr. Christian Kral, Vienna, Austria Modelica and virtual education</td>
</tr>
<tr>
<td>10:30 – 11:00</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>11:00 – 12:15</td>
<td>Session 1A: Buildings 1</td>
</tr>
<tr>
<td></td>
<td>Session 1B: Power&amp;Energy 1</td>
</tr>
<tr>
<td></td>
<td>Session 1C: FMI 1</td>
</tr>
<tr>
<td></td>
<td>Session 1D: Automotive 1</td>
</tr>
<tr>
<td>12:15 – 12:45</td>
<td>Lunch</td>
</tr>
<tr>
<td>13:45 – 15:00</td>
<td>Session 2A: Buildings 2</td>
</tr>
<tr>
<td></td>
<td>Session 2B: Power&amp;Energy 2</td>
</tr>
<tr>
<td></td>
<td>Session 2C: FMI 2</td>
</tr>
<tr>
<td></td>
<td>Session 2D: Electrical Power 2</td>
</tr>
<tr>
<td>15:00 – 15:30</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>15:30 – 17:00</td>
<td>Postersession</td>
</tr>
<tr>
<td>17:00 – 18:40</td>
<td>Session 3A: HVAC</td>
</tr>
<tr>
<td></td>
<td>Session 3B: Language</td>
</tr>
<tr>
<td></td>
<td>S. 3C: Mechanics&amp;Transport</td>
</tr>
<tr>
<td></td>
<td>Session 3D: New Applications</td>
</tr>
<tr>
<td>18:40 – 20:00</td>
<td>Transfer to Dinner Location</td>
</tr>
<tr>
<td>20:00</td>
<td>Conference Dinner at the Castle of Emmeram</td>
</tr>
</tbody>
</table>

## Wednesday, March 6

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 – 09:15</td>
<td>Keynote 2: Dr. Gerd Rösel, Regensburg, Germany Simulation Guided Design for New Automotive Applications</td>
</tr>
<tr>
<td>09:15 – 09:30</td>
<td>Short Break</td>
</tr>
<tr>
<td>09:30 – 10:45</td>
<td>Session 4A: Power&amp;Energy 3</td>
</tr>
<tr>
<td></td>
<td>Session 4B: Automotive 2</td>
</tr>
<tr>
<td></td>
<td>Session 4C: Aerospace</td>
</tr>
<tr>
<td></td>
<td>Session 4D: Numerical Methods</td>
</tr>
<tr>
<td>10:45 – 11:15</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>11:15 – 12:30</td>
<td>Session 5A: Buildings 3</td>
</tr>
<tr>
<td></td>
<td>Session 5B: Power&amp;Energy 4</td>
</tr>
<tr>
<td></td>
<td>Session 5C: Thermodynamic 1</td>
</tr>
<tr>
<td></td>
<td>Session 5D: Electrical Power 2</td>
</tr>
<tr>
<td>12:30 – 14:00</td>
<td>Lunch</td>
</tr>
<tr>
<td>14:00 – 15:15</td>
<td>Session 6A: Buildings 4</td>
</tr>
<tr>
<td></td>
<td>Session 6B: Thermodynamic 2</td>
</tr>
<tr>
<td></td>
<td>Session 6C: Tools</td>
</tr>
<tr>
<td></td>
<td>Session 6D: Automotive 3</td>
</tr>
<tr>
<td>15:15 – 15:30</td>
<td>Short Break</td>
</tr>
<tr>
<td>15:30 – 15:45</td>
<td>Closing Session</td>
</tr>
</tbody>
</table>
13:00 –16:30 Industrial User Presentations and Tutorials

- **Industrial User Presentations**
  - FMI+DCP+SSP
  - LANG+LIB

- **Tutorials**
  - Livio Mariano / Altair
    - Connecting Separated Worlds for True Multidisciplinary System Simulation – by Using Altair Activate™
  - Peter Fritzson / OSMC et al
    - Introduction to Modeling, Simulation, Debugging, and Julia Interoperability with Modelica and OpenModelica
  - Thomas Beutlich / ESI ITI
    - Creating and Working with Modelica-State-Machines
  - Edmund Widl / AIT
    - The FMI++ Python Interface: A Python package for importing and exporting FMUs
  - Lennart Ochel and Robert Braun / OSMC
    - Introduction to FMI including Model-Exchange and Co-simulation, SSP, and Graphic Editing of Composite FMI Models
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019
  - Michael Hoffmann
    - Altair’s Open Integration Platform for Multi-Disciplinary System Simulation
  - Thomas Hofmann
    - ESI Group: SimulationX 4.0
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019
  - Thomas Beutlich / ESI ITI
    - Creating and Working with Modelica-State-Machines
  - Edmund Widl / AIT
    - The FMI++ Python Interface: A Python package for importing and exporting FMUs
  - Lennart Ochel and Robert Braun / OSMC
    - Introduction to FMI including Model-Exchange and Co-simulation, SSP, and Graphic Editing of Composite FMI Models
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019
  - Michael Hoffmann
    - Altair’s Open Integration Platform for Multi-Disciplinary System Simulation
  - Thomas Hofmann
    - ESI Group: SimulationX 4.0
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019
  - Thomas Beutlich / ESI ITI
    - Creating and Working with Modelica-State-Machines
  - Edmund Widl / AIT
    - The FMI++ Python Interface: A Python package for importing and exporting FMUs
  - Lennart Ochel and Robert Braun / OSMC
    - Introduction to FMI including Model-Exchange and Co-simulation, SSP, and Graphic Editing of Composite FMI Models
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019

16:30 –17:00 Coffee Break

17:00 –19:15 Vendor Sessions

- **Altair**
  - Michael Hoffmann
    - Altair’s Open Integration Platform for Multi-Disciplinary System Simulation
  - Thomas Hofmann
    - ESI Group: SimulationX 4.0
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019
  - Michael Hoffmann
    - Altair’s Open Integration Platform for Multi-Disciplinary System Simulation
  - Thomas Hofmann
    - ESI Group: SimulationX 4.0
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019

- **ESI ITI**
  - Thomas Hofmann
    - ESI Group: SimulationX 4.0
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019
  - Michael Hoffmann
    - Altair’s Open Integration Platform for Multi-Disciplinary System Simulation
  - Thomas Hofmann
    - ESI Group: SimulationX 4.0
  - Peter Fritzson et al
    - OpenModelica Status and News
  - Jiří Navrátil and Johan Windahl
    - Modelon – What’s New for 2019

- **Dassault Systemes**
  - Dag Brück et al
    - Recent updates and candidate directions for development in Dymola and 3DEXPERIENCE
  - Jan Brugard
    - Providing Modelica to millions of users
  - Thomas Richard
    - MapleSim 2018 and Expanded FMI Support
  - Adrien Guironnet et al
    - Dynaω, an open source hybrid C++/Modelica tool for power system simulations
  - Ramesh Praveenkumar
    - Running FMUs in real-time under Simulation Workbench (SimWB)
  - Dag Brück et al
    - Recent updates and candidate directions for development in Dymola and 3DEXPERIENCE
  - Jan Brugard
    - Providing Modelica to millions of users
  - Thomas Richard
    - MapleSim 2018 and Expanded FMI Support
  - Adrien Guironnet et al
    - Dynaω, an open source hybrid C++/Modelica tool for power system simulations
  - Ramesh Praveenkumar
    - Running FMUs in real-time under Simulation Workbench (SimWB)

- **Siemens**
  - Bruno Lacabanne
    - Combining Modelica models, FMUs and causal libraries in a same environment, Simcenter Amesim
  - Mike Dempsey
    - Modelica and FMI solutions from Claytex
  - Manzoor Tiwana
    - ANSYS Twin Builder: Simulation based Digital Twin using Modelica
  - Bruno Lacabanne
    - Combining Modelica models, FMUs and causal libraries in a same environment, Simcenter Amesim
  - Mike Dempsey
    - Modelica and FMI solutions from Claytex
  - 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 trough Management of Model Meta Data
- Christian Bertsch
  - Usage of FMI at Bosch – status and outlook
- Tim Schenk, Andrés Botero Halblaub and Jan Christoph Wehrstedt
  - Co-Simulation scenarios in industrial production plants
- Magnus Eek and Robert Hällqvist
  - Enhancing the Model Integration Workflow in Aircraft System Simulation using FMI & SSP
- Nadja Marko, Hannes Schneider, Andreas Biehn and Jonas Rübsam
  - Simulation of sensor models for testing ADAS using DCP
- Juan Carlos Mendo, Borja García and Alejandro Torres
  - Enabling Standardized Distributed Co-Simulation at Boeing

## 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 Gräber, Jennifer Puschke, Tobias Henß, Eugen Dering, Andreas Pillekeit, Christian Schulze
  - Physical Modeling of Heat Pumps for Hardware-in-the-Loop Testing
- Jungdo Kee, Daeho 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
- Andreas Soppa, Sinan Balci and Martin Benedikt
  - DCP application use-cases at Volkswagen AG
<table>
<thead>
<tr>
<th>Time</th>
<th>Session 1A: Buildings 1</th>
<th>Session 1B: Power &amp; Energy 1</th>
<th>Session 1C: FMI 1</th>
<th>Session 1D: Automotive 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:25 – 10:50</td>
<td>■  S051</td>
<td>■  S054</td>
<td>■  S052</td>
<td></td>
</tr>
<tr>
<td>11:50 – 12:15</td>
<td>■  S053</td>
<td>■  S055</td>
<td>■  S056</td>
<td></td>
</tr>
</tbody>
</table>

**Program Overview**

- **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
<table>
<thead>
<tr>
<th>Session 2A: Buildings 2</th>
<th>Session 2B: Power&amp;Energy 2</th>
<th>Session 2C: FMI 2</th>
<th>Session 2D: Electrical Power 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:45 – 15:00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nadine Aoun, Roland Bavière, Mathieu Vallée, Adrien Brun, Guillaume Sandou</td>
<td>Torsten Schwan, Ole Ziessler, Tom Eckhardt, Rene Unger</td>
<td>Claire-Eleuthérianne Gerrer, Sylvain Girard</td>
<td>Alexander Grimm, Anton Haumer</td>
</tr>
<tr>
<td>Filip Jorissen, Lieve Helsen</td>
<td>Abdulrahman Dahash, Annette Steingrube, Mehmet Elci, Fabian Ochs</td>
<td>Slaven Glumac, Zdenko Kovačić</td>
<td>Mads Nannestad, Benoit Bidoggia, Zhe Zhang, Tiberiu-Gabriel Zsurzsan, Kasper Skriver</td>
</tr>
<tr>
<td>An Extended Luenberger Observer for HVAC Application using FMI</td>
<td>Automated model generation and simplification for district heating and cooling networks</td>
<td>Energy balance based Verification for Model Based Development</td>
<td>A Model Predictive Control Application for a Constrained Fast Charge of Lithium-ion Batteries</td>
</tr>
</tbody>
</table>

15:00 – 15:30 Coffee Break
15:30 – 17:00 Postersession | Forum Building K
<table>
<thead>
<tr>
<th>15:30 – 17:00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hans Olsson</strong></td>
</tr>
<tr>
<td><strong>Andreas Nicolai, Anne Paepcke, Hauke Hirsch</strong></td>
</tr>
<tr>
<td>Robust and accurate co-simulation master algorithms applied to FMI slaves with discontinuous signals using FMI 2.0 features</td>
</tr>
<tr>
<td><strong>Atiyah Elsheikh</strong></td>
</tr>
<tr>
<td><strong>Sooncheol Park, Yonggwon Jeon, Dae-Oh Kang, Min-Su Hyun, Seung-Jin Heo</strong></td>
</tr>
<tr>
<td>Predicting the vehicle performance at an early stage of development process via suspension bush design tool</td>
</tr>
<tr>
<td><strong>Jean-Philippe Chancelier, Sébastien Furic, Pierre Weis</strong></td>
</tr>
<tr>
<td>Translating Simulink Models to Modelica using the \NSP Platform</td>
</tr>
<tr>
<td>Session 3A: HVAC</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>17:00 – 17:25</td>
</tr>
<tr>
<td>Rohit Dhumane,</td>
</tr>
<tr>
<td>Jiazheng Ling,</td>
</tr>
<tr>
<td>Vikrant Aute,</td>
</tr>
<tr>
<td>Reinhard Radermacher</td>
</tr>
<tr>
<td>Modeling Supply</td>
</tr>
<tr>
<td>and Demand in</td>
</tr>
<tr>
<td>Modelica</td>
</tr>
<tr>
<td>Wenyi Wang,</td>
</tr>
<tr>
<td>Yaoyu Li</td>
</tr>
<tr>
<td>Real-time</td>
</tr>
<tr>
<td>optimization</td>
</tr>
<tr>
<td>of a cascade heat</td>
</tr>
<tr>
<td>pump via extreme</td>
</tr>
<tr>
<td>seeking</td>
</tr>
<tr>
<td>17:50 – 18:15</td>
</tr>
<tr>
<td>Hongtao Qiao,</td>
</tr>
<tr>
<td>Saleh Nabi, Xu</td>
</tr>
<tr>
<td>Han, Christopher</td>
</tr>
<tr>
<td>Laughman</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Coupled</td>
</tr>
<tr>
<td>simulation of</td>
</tr>
<tr>
<td>a room air</td>
</tr>
<tr>
<td>conditioner</td>
</tr>
<tr>
<td>models for</td>
</tr>
<tr>
<td>indoor</td>
</tr>
<tr>
<td>environment</td>
</tr>
</tbody>
</table>

17:00 – 18:40 | Transfer to Dinner Location |
18:40 – 20:00 | Conference Dinner at the Castle of Emmeram |
09:15 – 09:30   Short Break

09:30 – 10:45

Session 4A: Power&Energy 3
Johan Windahl, Håkan Runvik, Stephane Velut
Platform for Microgrid Design and Operation

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

Duansen Shangguan, 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

Session 4B: Automotive 2
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 hybrid electric propulsion systems

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

Session 4C: Aerospace
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, Fransiscus 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

Session 4D: Numerical Methods
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 hybrid electric propulsion systems

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

10:20 – 10:45
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, Fransiscus 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

10:45 – 11:15   Coffee Break
<table>
<thead>
<tr>
<th>Session 5A: Buildings 3</th>
<th>Session 5B: Power&amp;Energy 4</th>
<th>Session 5C: Thermodynamic 1</th>
<th>Session 5D: Electrical Power 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hauke Hirsch, Andreas Nicolai, Hans Petzold</td>
<td>Luis Corona-Meza-Moles, Jean-Philippe Argaud, Audrey Jardin, Amine Benssy, Yulu Dong</td>
<td>Dirk Zimmer</td>
<td>Biswarup Mukherjee, Luigi Vanfretti</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 5A: Buildings 3</th>
<th>Session 5B: Power&amp;Energy 4</th>
<th>Session 5C: Thermodynamic 1</th>
<th>Session 5D: Electrical Power 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queralt Altes-Buch, Sylvain Quoilin, Vincent Lemort</td>
<td>Yangyang Fu, Sen Huang, Draguna Vrabie, Wangda Zuo</td>
<td>Martin Otter, Hilding Elmqvist, Dirk Zimmer, Christopher Laughman</td>
<td>Marcelo de C. Fernandes, Luigi Vanfretti, Janaina G. de Oliveira, Maxime Baudette</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Session 5A: Buildings 3</th>
<th>Session 5B: Power&amp;Energy 4</th>
<th>Session 5C: Thermodynamic 1</th>
<th>Session 5D: Electrical Power 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan Rogers, Vickram Lakhian</td>
<td>Tobias Ramm, Mathias Ehrenwirth, Tobias Schrag</td>
<td>Maximilian Hebeler, Christian Schulze, Wilhelm Tegethoff, Jürgen Köhler</td>
<td>Andrea Bartolini, Francesco Casella, Adrien Guironnet</td>
</tr>
<tr>
<td>Time</td>
<td>Session A</td>
<td>Session B</td>
<td>Session C</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------</td>
<td>----------------------------------</td>
<td>------------------------------------------</td>
</tr>
</tbody>
</table>
| 14:00-15:15| Bruno Hadengue, Andreas Scheidegger, Eberhard Morgenroth, Tove A. Larsen  
Application of a Real Gas Model by Van-der-Waals for a Hydrogen Tank Filling Process | Adrian Pop, Per Östlund, Francesco Casella, Martin Sjölund, Rüdiger Franke  
A New OpenModelica Compiler High Performance Frontend | Wei Tao Chen, Shenhai Ran, Bengt Jacobson  
Integration and Analysis of EPAS and Chassis System in FMI-based co-simulation |
| 14:00-14:25| 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 | Sukhwinder Singh, Gerhard Schmitz, Bodo Mickan  
Modeling of the Flow Comparator Prototype as New Primary Standard for High Pressure Natural Gas Flow Metering | Bernt Lie, Arunkumar Palanisamy, Alachew Mengist, Lena Buffoni, Martin Sjölund, Adeel Asghar, Adrian Pop, Peter Fritzson  
OMJulia: An OpenModelica API for Julia-Modelica Interaction | Theodor Ensbury, Mike Dempsey, David Briant  
Virtual Proving Ground Testing: Deploying Dymola and Modelica to recreate Full Vehicle Proving Ground Testing Procedures |
| 14:25-14:50| Anne Senkel, Carsten Bode, Gerhard Schmitz  
Evaluating the Resilience of Energy Supply Systems at the Example of a Single Family Dwelling Heating System | Tim Eller, Florian Heberle, Dieter Brüggemann  
Transient modelling and simulation of a double-stage Organic Rankine Cycle | Christian Vering, Sven Hinrichs, Moritz Lauster, Dirk Müller  
"hello, (Modelica) world": Automated documentation of complex simulation models exemplified by expansion valves | Franz Rudolf Holzinger, Martin Benedikt  
Hierarchical Coupling Approach Utilizing Multi-Objective Optimization for Non-Iterative Co-Simulation |
| 14:50-15:15| | | | 

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:15-15:30</td>
<td>Short Break</td>
</tr>
<tr>
<td>15:30-15:45</td>
<td>Closing Session</td>
</tr>
</tbody>
</table>
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 to at least 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
or in the App4Event application 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 2019 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 Galgenbergstrabe 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
(Fire Service, Emergency Medical Service)
110 – Police
International Dialing Code of Germany +49

Tourist Information
For more information about Regensburg, please go to http://www.tourismus.regensburg.de

Regensburg City Transport Fares
Take bus number 6 operated by Regensburg Integrated Transport. Then alight at the „Tech Campus“ (Galgenbergstraße).
Passengers have to purchase their tickets before boarding the vehicle or entering the RVV system. The ticket is valid only if marked in the validation machine. Tickets can be bought in the bus or via RVV-App.
For more information: http://www.rvv.de
Or download the application RVV-App from Google Play or App Store.
SITE PLAN

Program of the 13th International Modelica Conference | March 4-6, 2019 | OTH Regensburg, Germany

16 | Program of the 13th International Modelica Conference | March 4-6, 2019 | OTH Regensburg, Germany
SITE PLAN

GROUND FLOOR

* to reach S053: some steps downstairs

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

FLOOR 1st

S054

S157

S159
SPONSORS & EXHIBITORS

Bronze Sponsors & Exhibitors

Silver Sponsors & Exhibitors
Gold Sponsors & Exhibitors

Gaio Technology provides tools and engineering services for Model-based development and System/Software Verification and Evaluation. Our biggest customer is the automotive industry, including both classic domains as well as the newer fields like AD/ADAS. We developed our own simulator for more than a hundred different MPU/MCUs, and use this technology to provide tools and solutions for Virtual Testing and ECU Simulation. We have enough experience and many successful projects using mathematical, E/E or physical models allowing coupled simulation. For more details and/or tool demos please come visit our booth or our Vendor Session on Monday March 4th, 18:30.

Siemens: Ingenuity for life

Today’s dreams need tomorrow’s engineering.
Simcenter: Engineer innovation.

Getting a dream rolling has never been more challenging. Products are smarter. Manufacturing processes are more complex. And design cycles are shorter than ever. Simcenter software can help. With its unique combination of multi-disciplinary simulation, advanced testing and data analytics. Simcenter gives you the power to explore alternatives faster, predict performance more accurately... and deliver innovation with greater confidence.

siemens.com/simcenter
Platin Sponsors & Exhibitors

An Open Integration Platform for Multi-Disciplinary System Simulation

Download a free trial at altair.com/Activate

DYMOLA and MODELICA
Since 1999

Simulation Tools and Modeling Services by Modelica Experts

- Modelica Libraries from DLR, TLK, XRG and others
- Sales & technical support for Dymola
- Automation and post-processing based on SCORE DaVE MoBA Lab
- Model development for thermal systems
- Training on Modelica and Dymola

Please visit our booth for hands-on experience of our tools.