20TH STUTTGART INTERNATIONAL SYMPOSIUM

AUTOMOTIVE AND ENGINE TECHNOLOGY
17 - 18 MARCH 2020 | HAUS DER WIRTSCHAFT, STUTTGART

PROGRAM

As at: 28 January 2020
The car is currently undergoing a complete reinvention. And for us there is a lot at stake: our role as technological pioneers, our economic strength, many jobs and conservation of our natural resources. The Stuttgart International Symposium for Automotive and Engine Technology, now in its 20th year, is intended to enable a fruitful exchange of expertise and creative ideas in order to meet this great challenge. I am delighted to be the patron for this event, and I welcome the participants from all around the world to our state capital!

The automotive industry is an especially important component of our economic power, particularly in Baden-Württemberg. Going forward, these key industries must adapt to ecological and political climate requirements. But we can only shape the future of our automotive economy by working together with everyone involved in this process. My state government is also supporting this development with the cross-sector "Baden-Württemberg Automotive Industry Strategic Dialog", because the transition to sustainable and digital mobility requires expertise from diverse areas – from business, science, trade unions, associations, civil society and politics.

With more than 100 lectures and 800 participants, the Stuttgart International Symposium is one of the largest congresses for vehicle and engine development in Europe. So I would like to take the opportunity to thank the organizers of this congress, and wish all the guests inspiring conversations and exciting new knowledge!
The zero carbon car – technical challenges of the future

The mobility transition and intermodal mobility; car sharing versus shared space, digitalization, automation and networking, e-fuels, batteries or fuel cells after all? The current discussions concerning the future of personal transport are generally characterized by uncertainty and open questions, rather than clear answers and confidence. This is perturbing the industry: unsettling it on the one hand and on the other hand making it more important than ever to get to grips with the issues involved.

With its focus on "The challenges of future technology" and its diverse program of lectures, the 20th Stuttgart International Symposium grapples with these questions. It hopes to help the industry approach these future-related topics and provide a platform for – potentially controversial – discussions.

The program structure has also changed. In response to requests from our participants we are now offering more opportunities for collaboration and networking:

» In the World Café, you can work on specific solutions for current problems in our industry. The results of this creative unit will be presented directly to a wide audience directly before the podium discussion.

» We’ll be celebrating the Stuttgart International Symposium’s 25th birthday with a stand party in the exhibition.

» A poster session and a tour of the exhibition are further new features.

You can also expect some optical changes on location, along with some familiar elements!

We are curious to hear your feedback and look forward to seeing you in Stuttgart on March 17 and 18, 2020!

Prof. Dr. Michael Bargende
Prof. Dr. Hans-Christian Reuss
Prof. Dr. Andreas Wagner
OVERALL VIEW
TUESDAY, 17 MARCH 2020

8:00 Registration/Signing-in

9:00 Welcome Prof. Dr. Hans-Christian Reuss, Chairman of the Board FKFS, Managing Director IVK, University of Stuttgart
9:05 Opening Address Prof. Dr. Dr. Wolfram Ressel, Rector of the University of Stuttgart
9:15 Opening Address Deputy Minister Ulrich Steinbach, Ministry of Science, Research and the Arts
9:30 Future of Mobility Christian Stach, Member Executive Board of Management of Powertrain Solutions at Robert Bosch GmbH

10:00 Coffee break

10:30 Strategies for Passenger Car Drivetrains 2030 Mobility I Mobility II Electric Motors Exhaust Gas Aftertreatment Driving Characteristics I Engine Mechanisms & Measurement Technology

12:00 Lunch break

13:00 Next Generation Mobility Mobility II Aerodynamics Transmissions ADAS & Autonomous Driving Charging

14:30 Coffee break

15:00 Ambition 2039: Our Path to a sustainable Mobility Dr. Torsten Eder, Vice President Product Group Drivetrain Mercedes-Benz AG

15:35 Guided Tour Exhibition World Café Driving Characteristics II Validation SI-Engines Reports from FVV-Projects

17:05 Anniversary reception within the exhibition for all attendees
19:00 Social evening to take place in the “Alte Stuttgarter Reithalle”

NEW FORMATS

On the afternoon of the first day in the World Café there will be the opportunity to work on specific solutions for a central and industry-relevant issue.

In this interactive format, participants are invited to sit at café tables with five or six industry colleagues and write, paint, or draw the results of their discussions directly on the tablecloth. After several minutes, the participants will swap tables and continue their discussions with a different set of people. The results will be presented on the second day directly before the panel discussion in the plenary session.

In an alternative format, parallel to the World Café, we will give you a guided tour through the exhibition – focusing on companies with different areas of expertise and solution approaches to future issues in the automotive industry.

The second day of the event starts with a poster session in parallel to the lecture program: in the exhibition, the different poster topics presented will invite you to have discussions in small groups, directly with the authors. You will find the poster contributions on the opposite page.

Each year, the specialist discussions with industry colleagues from different disciplines are of benefit to my everyday work. By exchanging views, we gain new perspectives and exciting approaches to the issues currently affecting the industry.

Dipl.-Ing. Dirk Naber
Department Manager Powertrain Solutions Engineering
Diesel Engine and Exhaust Gas Treatment System
Robert Bosch GmbH
WEDNESDAY, 18 MARCH 2020

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<th>Session</th>
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<tr>
<td>08:30</td>
<td>Poster session</td>
<td>2nd floor</td>
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<td>10:00</td>
<td>Coffee break</td>
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<td>10:30</td>
<td>Session</td>
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<td>11:05</td>
<td>Lunch break</td>
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<td>13:30</td>
<td>Session</td>
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<td>16:00</td>
<td>Session</td>
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<tr>
<td>17:05</td>
<td>Closing remarks</td>
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POSTER SESSION

P01 HiL out of the Box, but your Box – How Systems on Demand can relax your Timeline
Nicolas Marmann, F. Heidemann, SET GmbH

P02 NVH Aspects for Range Extender Integration into electric Vehicles
Frank Wolter, G. Eisele, C. Steffens, FEV Europe GmbH

P03 Reduction of Data by non-linear Distribution of Sampling Points without Loss in Accuracy
Andreas Haag, Robert Bosch Automotive Steering GmbH

P04 A Method for User-Friendly PID-Parameter Optimization for Highly Dynamic Test Benches
Kai Wolter, A. Albers, IPEK, Karlsruher Institut für Technologie (KIT)

P05 Using of an electrochemical Compressor for hydrogen Recirculation in Fuel Cell Vehicles
Wilhelm Wiebe, S. Schmitz, Duale Hochschule Baden-Württemberg

P06 Flux Squeeze Reluctance Motor Improves Motor Constant in Part-Load Operation of Electric Vehicles
Andreas Leich, TS, Deutsches Zentrum für Luft- und Raumfahrt (DLR); A. Luber, IAV GmbH; S. Schmidt, P. Hennig, M. Hohmuth, ILEAG e.V.

P07 No Bit Lost – High Precision Data Recording for automated Vehicle Development
Bernhard Kockoth, VIGEM GmbH

P08 Improving Vehicle Drag and Cooling Using a Novel Supplier Cooling Module Database
Satheesh Kandasamy, C.-W. Chang, SIMULIA Corporation; Y. Yagi, S. Miura, DENSO Corporation

P09 METAHYBRID Components with novel structural and functional Properties for Lightweight Construction
Eugen Pfeifer, AUTOMOTeam GmbH

P10 Ontology-driven Reconfiguration within automotive Development Processes
Manuel Klauss, T. Hauptie, NTT DATA Deutschland GmbH

P11 Physical Fatigue Modelling and practical Applications
Siegfried Schmader, M. Mlikota, IMWF, Universität Stuttgart

P12 Structural C-SMC Battery Case for Automotive Application
Federico Coren, FTG, TU Graz

P13 “What is the Status of your Development?” – Efficient Acquisition and Evaluation of Traceability Data
Andreas Graf, B. Holzer, itemis AG

I’ve been visiting the Stuttgart International Symposium for many years now: the diverse topics, the extensive range of training on offer and the opportunities for networking are always worth the trip to Stuttgart!

Dr. Panayotis Dimopoulos Eggenschwiler
Group Leader Exhaust Aftertreatment
Empa – Swiss Federal Laboratories for Materials Science and Technology
<table>
<thead>
<tr>
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<tr>
<td>9:00</td>
<td>Welcome Prof. Dr. Hans-Christian Reuss, Chairman of the Board FKFS, Managing Director IVK, University of Stuttgart</td>
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<td>Future of Mobility Christian Stach, Member Executive Board of Management of Powertrain Solutions at Robert Bosch GmbH</td>
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<td>11:00</td>
<td>Challenges of the WLTP Emission Regulations from an OEM Perspective Roland Kemmler, C. Müller, T. Deuschle, M. Liebing, S. Tyslik, Mercedes-Benz AG</td>
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<tr>
<td>11:30</td>
<td>Is the Hybrid Drive the right Concept for Fulfilling the CO₂-Emission Legislation of the Year 2030? Gerald Eifler, A. Dau, ElringKlinger Motortechnik GmbH</td>
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<td>11:00</td>
<td>People Mover Concept of Tomorrow Felix Jakob, AKKA Technologies</td>
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<td>11:30</td>
<td>Last Mile E-Van and Body with integrated Batteries Jürgen Erhardt, Erhardt GmbH Fahrzeug + Teile</td>
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<td>12:00</td>
<td>Lunch break</td>
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<tr>
<td>13:00</td>
<td>A mobility Study in commercial and industrial Areas of Stuttgart – Experiences and Conclusions Promoting Intermodality of Commuters Günter Sabow, Wirtschafts- und Industrievereinigung Stuttgart e.V.</td>
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<tr>
<td>13:00</td>
<td>Emission-free Driving Jan-Eric Raschke, MANN+HUMMEL International GmbH &amp; Co. KG</td>
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<td>13:30</td>
<td>Mobility Living Lab at the University of Stuttgart Wolf ram Ressel et al., Universität Stuttgart</td>
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<td>13:30</td>
<td>Towards a CO₂-free Mobility System in Germany from a technological Point of View Michael Kühn, P. Burghardt, H.-G. Hummel, Ellmotion GmbH</td>
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<tr>
<td>13:30</td>
<td>Optimized System Design of electric Drivetrains regarding Efficiency, Power Density and NVH Andreas Höfer, M. Herbel, P. Hamon, Valeo Siemens eAutomotive Germany GmbH</td>
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<tr>
<td>14:00</td>
<td>Future of multi-modal Mobility Jürgen Schlacht, Siemens Mobility GmbH</td>
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<td>14:00</td>
<td>Potentials for the Implementation of emission-free autonomous Delivery Traffic in inner Cities Dennis Wedler, T. Vietor, IKT, TU Braunschweig</td>
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<tr>
<td>14:00</td>
<td>FE-based Sensitivity Analysis of Stator Winding using Flatpack bending Technology David Wüterich, M. Kopp, SEG Automotive GmbH; M. Liewald, IFU, Universität Stuttgart</td>
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<td>10:00</td>
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### Transmissions
**Chairperson:** Prof. Dr. Bernhard Geringer

**RAUM KARLSRUHE 1st floor**

**ADAS & Autonomous Driving**
**Chairperson:** Prof. Dr. Michael Weyrich

**Charging**
**Chairperson:** Prof. Dr. Bernard Bäker

### Exhaust Gas Aftertreatment
**Chairperson:** Prof. Dr. Peter Eilts

### Driving Characteristics I
**Chairperson:** Prof. Dr. Günther Prokop

### Engine Mechanics & Measurement Technology
**Chairperson:** Prof. Dr. Frank Atzler

### 10:30 Wet Clutch as an Enabler of cost-efficient, Hybrid Drive Systems – Decoupling as functional Extension
Anne Bischofberger, A. Albers, S. Ott, IPEK, Karlsruher Institut für Technologie (KIT)

### 11:00 Objectified Evaluation of Shifting Quality of manual Transmissions during real Operation
Daniel Trost, E. Brosch, FKFS; H.-C. Reuss, FKFS/IVK, Universität Stuttgart

### 11:30 Gearbox Simulation for EVs: Optimization between Gear Rating, available Space and NVH Requirements
Chinhaya Chavan, T. Hiedlauf, hofer powertrain GmbH; J. Langhart, KISSsoft AG

### 10:30 AI for New ADAS User Interfaces: Opportunities through Cooperation or Risks?
Ulmich Bodenhausen, Vector Consulting Services GmbH

### 11:00 Determination of secured Lane Information for highly automated Vehicles
Sven Eckelmann, T. Trautmann, J. Fabich, Hochschule für Technik und Wirtschaft Dresden

### 11:30 Virtual Validation of Autonomous Vehicle Safety through Simulation-based Testing
Mustafa Saragouli, Q. Shi, A. Morozov, K. Janschek, IFA, TU Dresden

### 10:30 Scalable EV Charging System with central Infrastructure and DC distribution Grid
Taleb Janbein, T. Weil, E. Hoevenaars, Robert Bosch GmbH

### 11:00 100+ Charging Points – Grid friendly intelligent Load & Charge Management – ChargeBIG in Operation
Sebastian Ewert, W. Krepulat, M. Gerstadt, MAHLE International GmbH; H. Stamer, eliso GmbH

### 11:30 Energy und Automotive – Challenges for Grid Integration of E-Mobility
Ursel Willrett, IAV GmbH

### 13:00 Leveraging Big Data Analysis to enhance the Validation of Exhaust Gas Treatment Systems
Nicolas Ide, A. Serout, T. Dengler, T. Rankel, Robert Bosch GmbH

### 13:00 Empathic Assistants – Methods and Use Cases in automated and non-automated Driving
Anna-Antonia Pape, Sonja Cornelsen, V. Fäßler, TWT GmbH; K. Ihme, M. Oehl, U. Drewitz, Deutsches Zentrum für Luft- und Raumfahrt (DLR); F. Hartwich, TU Chemnitz; F. Schroedel, IAV Automotive Engineering; A. Lüdtke, OFFIS, Universität Oldenburg; M. Schramm, Soundreply GmbH

### 14:00 Pre-Turbo DeNOx Exhaust Gas Aftertreatment System for future 48V Diesel Powertrains
Johannes Hippi, C. Beidl, VKM, TU Darmstadt; D. Kraf, R. Anselm, BHN Bayern Innovationszentrum Nagold GmbH & Co. KG; G. Hohenberg, M. Conin, IVD Deutschland GmbH; J. Kreuz, U. Goebel, Umicro AG & Co. KG

### 14:00 Mechatronic System Design for EPS Systems with residual Modes and variable, nonlinear plant Behavior
Marcus Imre, H. Henrichfreise, TH Köln; M. Haßenberg, H. Briese, DMecS GmbH & Co. KG

### 14:00 Study to assess the Suitability of C/C-SiC as Material for Piston Rings
Alex Heron-Himmel, F. Kessel, Y. Shi, IF, Deutsches Zentrum für Luft- und Raumfahrt (DLR)
PROGRAM TUESDAY, 17 MARCH 2020

KÖNIG-KARL-HALLE 2nd floor

15:00 Ambition 2039: Our Path to a sustainable Mobility
Dr. Torsten Eder, Vice President Product Group Drivetrain Mercedes-Benz AG

KÖNIG-KARL-HALLE 2nd floor

15:35 Guided Tour Exhibition

MEIDINGER-SAAL 1st floor

15:35 World Café

BERTHA-BENZ-SAAL 1st floor

Driving Characteristics II
Chairperson: Prof. Dr. Frank Gauterin

15:35 Influence of body-in-white Stiffness on Elastokinematics
Naser Jafarzadehpour, M. Bidlingmaier, Mercedes-AMG GmbH; B. Corves, IGM, RWTH Aachen University

16:05 Ride Comfort Evaluation of Predictive Ride Height and Damper Control Adaptation on Single Obstacles
Konstantin Riedl, S. Schaer, J. Kreibich, M. Lienkamp, FTM, TU München; S. Cannon, C. Schimmel, AUDI AG

16:35 Objectification of the Feeling of Safety based on the Human Perception of Vehicle Motions
Martin Heiderich, F. Zantner, R. Kastner, H. Shibue, Honda R&D Europe (Deutschland) GmbH; J. Neubeck, FKFS; J. Wiedemann, FKFS/IVK, Universität Stuttgart

17:05 Anniversary reception within the exhibition for all attendees

People of all Ages from many different Countries and Companies attend the Stuttgart International Symposium and make this Conference so varied.

Prof. Dr.-Ing. Lennart Löfdahl
Professor in Fluid of Mechanics Department
Mechanics and Maritime Sciences
Chalmers University of Technology

17:05 Ambition 2039: Our Path to a sustainable Mobility
Dr. Torsten Eder, Vice President Product Group Drivetrain Mercedes-Benz AG

KÖNIG-KARL-HALLE 2nd floor

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Chalmers University of Technology
FESTIVE EVENING RECEPTION

Tuesday, 17 March 2020 | 18:30 in the “Alten Stuttgarter Reithalle” Maritim Hotel | Seidenstraße 34 | 70174 Stuttgart

Experience an exceptional evening with amusing entertainment.

Program:
18:30 Sparkling wine reception
19:00 Welcome by Prof. Dr. Michael Bargende, Board of Directors FKFS, Professor of Automotive Powertrains IVK, University of Stuttgart

Followed by: Dinner

Live Act:
Two Lead Guitars play the Blues

29-year-old guitar virtuoso Yasi Hofer from Ulm meets Werner Dannemann, the grand seigneur of German Blues-Rock. With an age gap of more than thirty years, this is an encounter of two generations of first-class original guitar music. In spite of her youth, Yasi has already played with great artists like Steve Vai. Werner has been on the stage for more than fifty years and has played with countless major performers, including Jack Bruce, Miller Anderson and Pete York. On this special evening, each of them will play their own songs as well as Cream or Jimi Hendrix classics. You can look forward to an evening of perfect singing and guitar play in two voices, in the tradition of Fleetwood Mac and Wishbone Ash.

Evening program ends at approx. 23:00.
### PROGRAM WEDNESDAY, 18 MARCH 2020

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<td>Poster session</td>
<td>KÖNIG-KARL-HALLE</td>
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<td>Methanol as an Electricity-based Fuel for Plug-in Hybrid Electric Vehicles</td>
<td>MEIDINGER-SAAL</td>
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<td>9:00</td>
<td>E-Fuels as chemical Energy Carrier under the Aspects of Costs and Efficiency</td>
<td>MEIDINGER-SAAL</td>
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<td>9:30</td>
<td>Potential Analysis and virtual Development of SI Engines operated with synthetic Fuel DMC+</td>
<td>MEIDINGER-SAAL</td>
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<td>8:30</td>
<td>The Test Process in Times of Big Data and Machine Learning</td>
<td>BERTHA-BENZ-SAAL</td>
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<td>9:00</td>
<td>Testing ADAS End-of-Line – avoid the hazardous Effects</td>
<td>BERTHA-BENZ-SAAL</td>
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<td>9:30</td>
<td>Consumption-relevant Load Simulation during Cornering at the Vehicle Test Bench VEL</td>
<td>BERTHA-BENZ-SAAL</td>
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<td>10:00</td>
<td>Coffee break</td>
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<td>10:30</td>
<td>MAZDA’s advanced Powertrain Strategy for 2030</td>
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<td>Eiji Nakai, Executive Officer Powertrain Development Mazda Motor Corporation</td>
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<td>11:05</td>
<td>The future of combustion engines from the perspective of rail applications</td>
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<td>Supporting the Synthesis of electrical Drive Systems with Scenario Analysis</td>
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<td>AI and Big Data Management for Autonomous Driving</td>
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<td>IVECO Magirus AG (angefragt)</td>
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<td>11:35</td>
<td>Multipurpose Oil Filter Systems for Innovative Drivetrains and e-Axles</td>
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<td>11:35</td>
<td>Semantic Segmentation of Solid-state LiDAR Measurements for Automotive Applications</td>
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<td>12:05</td>
<td>The Commercial Vehicle in 10 years and beyond – still with a classic ICE?</td>
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<td>12:05</td>
<td>Breaktor™ – advanced Protection for high voltage Circuits in electric Vehicles</td>
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<td>12:05</td>
<td>Method for a scenario-based and weighted Assessment of map-based advanced Driving Functions</td>
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<td>12:35</td>
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**Fuels**
Chairperson: Prof. Dr. Stefan Pischinger

**Testing**
Chairperson: Prof. Dr. Karl-Ludwig Haken
Sensors & Actuators
Chairperson: Prof. Dr. Karl-Ludwig Krieger
8:30 Using Machine Learning Methods to develop virtual NOx Sensors for Vehicle Applications
Robert Fechert, B. Bäker, S. Gereke, F. Atzler, IAD, TU Dresden

8:30 Phase Change Cooled Manifold for RDE Compliant Powertrains
Thomas Arnold, M. Krause, IAV GmbH

8:30 Continuous Integration in Powertrain Development – Today & Tomorrow
Daniel Heß, IAV GmbH

9:00 Condition Monitoring of a Multi-LED-Headlamp with one Image Sensor
Pascal Janke, J. Cai, HELLA GmbH & Co. KGaA; M. Niedling, L-LAB; T. Bertram, RST, TU Dortmund

9:00 Analysis of Scavenging Air Post-Oxidation by Means of 3D-CFD Simulation including Reaction Mechanism
Rodolfo Tromellini, J. Przewlocki, F. Cupo, M. Chiodi, M. Bargende, FKFS/IVK, Universität Stuttgart

9:00 Managing Software Evolution in embedded automotive Systems
Lukas Block, IAT, Universität Stuttgart

9:30 Measurement and Testing of Lidarsensors
Andy Günther, B. Bäker, IAD, TU Dresden

9:30 Use of Oxygenatblends as Inflammation Aid in diluted Mixtures
Moritz Grüninger, O. Toedter, T. Koch, IFKM, Karlsruher Institut für Technologie (KIT)

9:30 Agile Systems Engineering for Critical Systems
Christof Ebert, Vector Consulting Services GmbH

10:00 Coffee break

Software
Chairperson: Prof. Dr. Lennart Löfdahl

EE-Architecture
Chairperson: Prof. Dr. Dr. Gerhard Hettich

Powertrain Simulation
Chairperson: Prof. em. Dr. Günter Hohenberg

11:05 Credibility of Software-in-the-Loop Environments for integrated Vehicle Function Validation
Indrasen Raghupatrani, S. Burton, T. Huber, M. Boumans, A. Reiter, Robert Bosch GmbH

11:05 Design of fault tolerant electrical Energy Supply Systems for automated electric Vehicles
Marcus Goth, D. Keilhoff, IVK, Universität Stuttgart; H.-C. Reuss, FKFS/IVK, Universität Stuttgart

11:05 Discretization and Heat Transfer Calculation of Engine Water Jackets in 1D-Simulation
Florian Mandl, IVK, Universität Stuttgart; M. Grill, FKFS; M. Bargende, FKFS/IVK, Universität Stuttgart

11:35 Discretization and Heat Transfer Calculation of Engine Water Jackets in 1D-Simulation
Florian Mandl, IVK, Universität Stuttgart; M. Grill, FKFS; M. Bargende, FKFS/IVK, Universität Stuttgart

12:05 Continuous Development Environment for the Validation of autonomous Driving Functions
Sebastian Lutz, M. Behrendt, A. Albers, IPEK, Karlsruher Institut für Technologie (KIT)

12:05 Toolchain for Architecture Development, Modeling and Simulation of Battery Electric Vehicles
Carl Friedrich Hettig, P. Orth, FEV Europe GmbH; M. Deppe, T. Pajenkamp, dSpace GmbH; C. Granrath, J. Andert, RWTH Aachen University

12:05 Accelerated Assessment of Optimal Fuel Economy Benchmarks for Developing the next Generation HEVs
Pier Giuseppe Anselma, G. Belingardi, Politecnico di Torino

12:35 Lunch break
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<tr>
<td>13:30</td>
<td>5G Netzinfrastruktur &amp; Autonomes Fahren – die nächste Generation C-V2X Technologie</td>
<td>Walter Haas, HUAWEI TECHNOLOGIES Deutschland GmbH</td>
<td>Huawei Technologies Deutschland GmbH</td>
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<td>13:30</td>
<td>Range Prediction and e-Mobility – the Complexity behind a Length Scale</td>
<td>Rafael Abel, F. Beutenmüller, S. Stein</td>
<td>TWT GmbH</td>
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<td>Validation of Fuel Cell Control Units with powerful Fuel Cell Simulation Platforms</td>
<td>Michael Seeger, MicroNova</td>
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<td>14:00</td>
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<td>Joscha Reber, L. Braun, Evobus GmbH</td>
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<td>14:00</td>
<td>Range Prediction and e-Mobility – the Complexity behind a Length Scale</td>
<td>Rafael Abel, F. Beutenmüller, S. Stein</td>
<td>TWT GmbH</td>
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<td>14:00</td>
<td>JENOPTIK – Photonic Age in Automotive Industry</td>
<td>Martin Enenkel, JENOPTIK Optical Systems GmbH</td>
<td>JENOPTIK Optical Systems GmbH</td>
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<td>14:30</td>
<td>The Gateway to an electrified last mile Ecosystem – project “bring your own Battery”</td>
<td>Markus Geiger, B. Budaker, csi entwicklungstechnik GmbH; G. Lange, C. Schmidt, AUDI AG</td>
<td>csi entwicklungstechnik GmbH; AUDI AG</td>
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<td>14:30</td>
<td>How accurate can the Range Calculation of an electric Vehicle be?</td>
<td>Lisa Braun, Evobus GmbH</td>
<td>Evobus GmbH</td>
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<td>15:00</td>
<td>ECMS based on system-specific Control Parameter Adaption of a Fuel Cell Hybrid Electric Vehicle</td>
<td>Sergei Hahn, J. Braun, H. Kemmer, Robert Bosch GmbH; H.-C. Reuss, FKFS/IVK, Universität Stuttgart</td>
<td>Robert Bosch GmbH; FKFS/IVK, Universität Stuttgart</td>
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</tbody>
</table>

15:30 Coffee break

16:00 Result presentation World Café

16:20 Panel discussion “The Carbon Neutral Car”
  **Moderation:** Johannes Winterhagen, Redaktionsbüro delta eta
  **Participants:**
  - Thomas Bareiß MdB, Federal Ministry for Economic Affairs and Energy
  - Dr. Ulrich Eichhorn, IAV GmbH
  - Christian Hochfeld, Agora Verkehrswende
  - Wolfgang Müller-Pietralia, VW AG

17:05 Closing remarks
  **Prof. Dr. Andreas Wagner, Board of Directors FKFS, Professor of Automotive Engineering IVK, University of Stuttgart**
Hybrid Powertrains
Chairperson: Prof. Dr. Christian Beidl

13:30 Impact of Future 48 V-Systems on Powertrain Operation under Real-Driving Conditions
Daniel Förster, M. Timmann, R. Inderka, J. Strenkert, Daimler AG; F. Gauterin, Karlsruhe Institut für Technologie (KIT)

14:00 Model based Development of Optimum Control Strategies for Hybrid Electric Vehicles
Christoph Pötsch, J. Hahn, A. Cvikel, J. Wurzenberger, AVL List GmbH

RAUM REUTLINGEN 2nd floor

Heating & Cooling
Chairperson: Prof. Dr. Stefan Böttinger

13:30 Model-based Approach for on-demand Temperature Control
Alexander Herzog, A. Vagapov, IAV GmbH; M. Fuchs, IIT, Leibniz Universität Hannover

14:00 Preheating Components with metal Hydrides or Lime – small, high Power, no additional Energy
Mila Kölbig, J. Bürger, M. Schmidt, M. Linder, IIT, Deutsches Zentrum für Luft- und Raumfahrt (DLR)

RAUM KARLSRUHE 1st floor

Battery
Chairperson: Prof. Dr. Andreas Friedrich

13:30 Front Loading Approach in Battery Development for Changing Cell Chemistry
Paul Schiffbänker, B. Brunsteiner, M. Volck, AVL List GmbH

14:00 CO₂-neutral Battery Production in Europe – How to make it happen?
Markus Hackmann, R. Stanek, P3 automotive GmbH

RAUM MANNHEIM 1st floor

13:00 Impact of Future 48 V-Systems on Powertrain Operation under Real-Driving Conditions
Daniel Förster, M. Timmann, R. Inderka, J. Strenkert, Daimler AG; F. Gauterin, Karlsruhe Institut für Technologie (KIT)

14:00 Model based Development of Optimum Control Strategies for Hybrid Electric Vehicles
Christoph Pötsch, J. Hahn, A. Cvikel, J. Wurzenberger, AVL List GmbH

14:30 Virtual Powertrain – Vehicle Simulation on the Engine Test Bench with an implemented Hybrid Topology
Sebastian Lachenmaier, L. Cross, C. Ferrara, A. Greis, M. Wüst, D. Naber, Robert Bosch GmbH

15:00 MAHLE Modular Hybrid Drive with passive MAHLE Jet Ignition
Mike Bassett, S. Reader, MAHLE Powertrain Limited; M. Berger, N. Fraser, MAHLE Powertrain GmbH

14:00 Preheating Components with metal Hydrides or Lime – small, high Power, no additional Energy
Mila Kölbig, J. Bürger, M. Schmidt, M. Linder, IIT, Deutsches Zentrum für Luft- und Raumfahrt (DLR)

14:30 Fast running detailed Battery Thermal Management Models based on 1D-3D Synergetic Approach
Dig Vijay, N. Framke, P. Stopp, Gamma Technologies GmbH

15:00 Artificial Intelligence in predictive Thermal Management for Passenger Cars
Felix Korthals, M. Stöcker, Daimler AG; S. Rinderknecht, IMS, TU Darmstadt

14:30 Higher Sustainability with a second Life of used e-Vehicle Batteries
Jürgen Kölich, EVA Fahrzeugtechnik GmbH

15:00 Increased Safety for Battery Electric Vehicles by using heat-resistance Stainless Steels
Stefan Lindner, Outokumpu Nirosta GmbH

15:30 Coffee break

For me, participating in the Stuttgart International Symposium is a must! I enjoy visiting the Stuttgart International Symposium every year – both as a visitor and a speaker.

Dipl.-Ing. Ursel Willrett
Senior Speaker e-Mobility Infrastructure Systems
IAV GmbH
On Tuesday and Wednesday, an accompanying exhibition will take place in the foyers of the event facilities. Manufacturers and suppliers to the automotive industry will present the latest developments in vehicle, engine and measurement technology.

Exhibition maps and detailed exhibitor profiles are available on site. Find out more about the exhibitors [www.stuttgarter-symposium.de](http://www.stuttgarter-symposium.de)

**Exhibition opening times:**
- Tuesday 17 March 2020 | 8:00 – 18:00
- Wednesday 18 March 2020 | 8:00 – 15:30

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INFORMATION ABOUT THE SYMPOSIUM

EVENT LOCATION

Haus der Wirtschaft | Willy-Bleicher-Straße 19 | 70174 Stuttgart
Phone +49 711 123-0 | www.hausderwirtschaft.de

INFORMATION & CONTACT

Questions about the event
info@fkfs-symposium.de | Phone +49 711 4605376-8

ACCOMMODATION

Hotel Maritim
Reservation-Code: Stuttgarter Symposium
Available until 24 February 2020
Maritim Hotel Stuttgart | Seidenstraße 34 | 70174 Stuttgart
Phone: +49 711 942-0
E-mail: info.stu@maritim.de

SERVICE ON-SITE

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The registration desk is located in the foyer on the 1st floor.
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Tuesday, 17 March 2020 | 8:00 – 19:00
Wednesday, 18 March 2020 | 7:30 – 17:30
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Please book your travel request at the information counter on the 2nd floor in front of the König-Karl-Halle.
In the morning there is a shuttle service from the Maritim Hotel to the Haus der Wirtschaft.
Please consider that only transfers in the Stuttgart area are provided.

LANGUAGE

The official symposium language is German. All presentations will be simultaneously interpreted in both directions.

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The Stuttgart International Symposium is aimed at the management and employees of automotive manufacturers and their suppliers working in research, development and production, as well as development service providers, software companies, associations, politicians and universities.

FEES

Symposium participation fee € 995 excl. VAT
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Doctoral candidate € 360 excl. VAT
Day ticket € 595 excl. VAT
Day ticket with university discount € 395 excl. VAT
Day ticket doctoral candidate € 260 excl. VAT

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- Access to all events on both days and with a day ticket respectively for the day booked
- Conference documentation
- Lunch, cold drinks and coffee at break times
- Access to the formal evening reception on 17 March 2020

Students € 119 including VAT
For students of the University of Stuttgart a limited number of free tickets are available. These can be collected upon presentation of the certificate of enrollment and prior appointment from 13 January 2020 on in the institute:
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Further information: symposium@fkfs.de

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Register now at www.stuttgarter-symposium.de
You can find the conditions of participation for the event online at fkfs-veranstaltungen.de/3/terms-and-conditions/

ORGANIZERS

FKFS – Research Institute of Automotive Engineering and Vehicle Engines Stuttgart
Pfaffenwaldring 12 | 70569 Stuttgart | www.fkfs.de
Phone +49 711 685-65888 | symposium@fkfs.de

Scientific Management
Prof. Dr. Michael Bargende, Managing Board Automotive Powertrains
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Photos: Frank Eppler and Uli Regenscheit
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