Developing Solutions Together

The Aachen Colloquium Sustainable Mobility celebrates its 30th anniversary this year. Under the scientific management of Prof. Dr. techn. Franz Pischinger and Prof. Dr.-Ing. Jürgen Helling, the first “Aachen Colloquium Automobile and Engine Technology” took place in 1987. The underlying idea of treating the two topics of engine and automobile together and searching for solutions in joint efforts generated great enthusiasm among the international participants.

Today, more than 30 years later, we are expanding the basic idea of interdisciplinary collaboration, as it has proven to be right and important. At this year’s Aachen Colloquium, we are not only looking at the automobile and its engine, but at the topic of mobility as a whole, with findings from research and industry. An important focus is the development of sustainable solutions for efficient, safe and environmentally friendly mobility of the future.

The 30th Aachen Colloquium Sustainable Mobility

This year, you can look forward again to 100 specialist presentations from renowned companies and institutes. In our detailed program overview you will find innovative topics as mobility and vehicle concepts of tomorrow, automated and connected driving, fuel cells, battery systems and electric drive units. This is rounded off by the red-hot subject of hydrogen, zero-impact emissions, life cycle analyses and strategy considerations in the automotive industry.

The plenary lectures by selected experts will be a special highlight of the event. Markus Duesmann, chairman of the bord of AUDI AG, will speak on the topic of electromobility as an opportunity and driver for growth. Dr.-Ing. Stefan Hartung, member of the board of management of Robert Bosch GmbH, will give an outlook on the mobility of the future in his presentation. Prof. Dr. Ralf G. Herrtwich, Senior Director of NVIDIA, will deal with the intelligence of cars and Dr. Ahn, Senior Vice President, will offer an insight into the future vision of electric vehicles at Hyundai Mobis.

Outside of the lecture halls, you can expect numerous well-known companies who will personally present their innovations and answer your questions. As in each year, the Aachen Colloquium offers various opportunities for discussion and direct exchange with experts from all over the world. For the 30th anniversary, you can also look forward to other interesting program items.

We look forward to your participation in the anniversary event 30th Aachen Colloquium Sustainable Mobility!
The demands placed on mobility and sustainability have grown exponentially. There can be little doubt that the automotive industry as a whole is entering a new era. In times of transition, it is good to know that reliability and innovation are available from a single source. As a leading technology group with a global reach, we offer pioneering solutions for any type of drive concept. Alongside steadily evolving lightweighting expertise that can be applied to any drive system, we supply components for lithium-ion batteries. Through our new joint venture EKPO Fuel Cell Technologies, we offer high-performance fuel cell stacks and components. In doing so, we are helping to shape the future of mobility.

www.elringklinger.com
### Monday, October 4th, 2021

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:00</td>
<td>Welcome Reception &amp; Opening of the Technical Exhibition</td>
</tr>
<tr>
<td>18:45</td>
<td>Poster presentations</td>
</tr>
</tbody>
</table>

### Tuesday, October 5th, 2021

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>Opening Plenary Session</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
</tr>
<tr>
<td>10:30</td>
<td>Battery Systems</td>
</tr>
<tr>
<td></td>
<td>Automotive Strategy Concepts I</td>
</tr>
<tr>
<td></td>
<td>Thermal Management</td>
</tr>
<tr>
<td>12:00</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>13:30</td>
<td>Fuel Cells I</td>
</tr>
<tr>
<td></td>
<td>Life Cycle Assessment</td>
</tr>
<tr>
<td>15:30</td>
<td>Break</td>
</tr>
<tr>
<td>16:30</td>
<td>Zero Impact Emission Concepts</td>
</tr>
<tr>
<td></td>
<td>Battery Cooling</td>
</tr>
<tr>
<td></td>
<td>Heavy Duty Emission Concepts</td>
</tr>
</tbody>
</table>

### Wednesday, October 6th 2021

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30</td>
<td>Hybrid &amp; Range-Extender-Concepts</td>
</tr>
<tr>
<td></td>
<td>Application of Alternative Fuels</td>
</tr>
<tr>
<td></td>
<td>Reports from FVV-Projects</td>
</tr>
<tr>
<td></td>
<td>Electric Motors</td>
</tr>
<tr>
<td></td>
<td>HMI &amp; User Experience</td>
</tr>
<tr>
<td>10:00</td>
<td>Break</td>
</tr>
<tr>
<td>11:00</td>
<td>New Engine Technologies</td>
</tr>
<tr>
<td></td>
<td>Automotive Strategy Concepts II</td>
</tr>
<tr>
<td></td>
<td>Fuel Cells II</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>14:00</td>
<td>Hydrogen Combustion Engine</td>
</tr>
<tr>
<td></td>
<td>48V Technologies</td>
</tr>
<tr>
<td></td>
<td>Commercial Vehicle &amp; All-Wheel Drive Technologies</td>
</tr>
<tr>
<td></td>
<td>Data for Automated Driving</td>
</tr>
<tr>
<td>15:30</td>
<td>Break</td>
</tr>
<tr>
<td>16:00</td>
<td>Closing Plenary Session</td>
</tr>
</tbody>
</table>
Dipl.-Ing. Markus Duesmann  
Chairman of the Board of Management and Board of Management Member for Product Lines at AUDI AG

Markus Duesmann was born on June 23, 1969 in Heek, North Rhine-Westphalia. In 1991, he completed his studies of mechanical engineering at Steinfurt University of Applied Sciences with a degree in engineering. He began his career in 1992 as a design engineer for a V12 series-production engine at Mercedes-Benz in Stuttgart. In 1995, he moved to the development service provider FEV GmbH in Aachen, where he held various positions, the last of which was head of the engine mechanics division.

In 2004, he took over the position of main department manager for new diesel engines at DaimlerChrysler AG in Stuttgart, and in 2005 became head of Formula 1 development at Mercedes-Benz in Brixworth in the United Kingdom.

In 2007, Markus Duesmann moved to BMW AG as head of Formula 1 powertrain. After holding several responsible positions at that company, he was Board of Management Member for Purchasing and Supplier Network at BMW AG from October 2016 until July 2018.

The Supervisory Board of AUDI AG appointed Markus Duesmann as Chairman of the Board of Management of AUDI AG effective April 1, 2020. Since then, he has also had Board of Management responsibility for Volkswagen Group Research and Development. Additionally he is entrusted with responsibility for the China business of the AUDI AG and with Board of Management responsibility for Product Lines at AUDI AG.

Dr.-Ing. Stefan Hartung  
Member of the Board of Management, Robert Bosch GmbH

Dr. Stefan Hartung has been a member of the board of management of Robert Bosch GmbH since January 2013. Since January 2019, he has been chairman of the Mobility Solutions business sector, and responsible for the Powertrain Solutions and Electrical Drives divisions. Prior to this, he was responsible for the Energy and Building Technology as well as the Industrial Technology business sectors, in addition to the Bosch Connected Industry business unit.

Born in Dortmund in 1966, Stefan Hartung is married and has two children. He studied mechanical engineering, specializing in manufacturing technology, at RWTH Aachen, where he also submitted his PhD on quality management methods in 1993.

He joined Bosch und Siemens Hausgeräte GmbH in Munich in 2004. Before that, he worked for the Fraunhofer Society and the management consultants McKinsey & Company in Düsseldorf.
Ralf G. Herrtwich runs automotive software development for NVIDIA in Europe. He currently focuses on artificial intelligence for autonomous vehicles and new automotive computing architectures. Past assignments in Dr. Herrtwich’s career include managing the Automotive and Services Business Units of HERE Technologies as well as developing self-driving vehicles for Mercedes-Benz. In 2013, his team made an S-Class re-enact the world’s first overland drive, covering the historic 65-miles Bertha Benz Route autonomously in regular traffic.

A computer scientist by education, Dr. Herrtwich started his career in academia at TU Berlin and UC Berkeley. He then held management positions with IBM and several telecommunication start-ups before joining Daimler in 1998 to manage its Advanced Engineering Centers on Telematics & Infotainment and, later, Driver Assistance & Chassis Systems.

Since 2009, he also is honorary professor for vehicle information technology at the Technical University of Berlin. In recognition of his contributions to computing innovations in the car industry, he was named Fellow of the German Computer Science Society in 2019.

Dr. Byung-Ki Ahn, born in 1963, studied Mechanical Engineering at the Seoul National University in Korea. In 1991, Dr. Ahn moved to the USA, where he obtained his doctoral degree at Virginia Tech, followed by occupations as Senior Research Scientist at the Pacific Northwest Nat’l Lab and as Senior Engineer at UTC Fuel Cells.

In 2004, he returned to Korea to begin his career at Hyundai MOBIS as Chief Researcher. From 2006 until 2017, Dr. Ahn directed the Fuel Cell and Eco-friendly vehicle Performance Development groups at Hyundai Motor, before returning to Hyundai MOBIS.

Currently, Dr. Ahn fulfills the position as Senior Vice President of the Electric Powertrain BU, R&D Division at Hyundai MOBIS in Korea.
Our Vision for a Digital Future!
...and we keep innovating mobility for the next 40 years

- software defined cars
- sustainability
- driving pleasure

CREATING IDEAS & DRIVING INNOVATIONS

www.fka.de/en/ack2021
Poster presentations Monday, October 4th 2021, 18:45

**Europa**

Session chair of the poster presentation
Prof. Dr. Hermann Rottengruber, IMS, Otto-von-Guericke University

<table>
<thead>
<tr>
<th>Poster 1</th>
<th>Lukas Laarmann, FH Aachen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Human Hybrids, Shared Vehicle and Airtaxis – Facing Sustainable Future with Mobility Thinking</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster 2</th>
<th>Prof. Dr. Andreas Lohner, TH Köln</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>eWheel2Car - A New Approach of Retrofitting Cars</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster 3</th>
<th>Prof. Dr. Vinod Rajamani, FH Dortmund</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lifecycle Analysis of the Hydrogen Combustion Engine and its Technology Enablers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster 4</th>
<th>Tobias Brinkmann, VKA RWTH Aachen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traffic-efficient and Energy-Optimized Longitudinal Control of an Autonomous Vehicle Using Deep Reinforcement Learning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster 5</th>
<th>Swantje Konradt, Otto-von-Guericke-Universität Magdeburg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Energetic Optimization of a PEM Fuel Cell Vehicle</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Poster 6</th>
<th>Pia Sophie Charlotte Dautzenberg, ika, RWTH Aachen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identification and Evaluation of Trust- Relevant Driving Situations for Automated Driving (SAE Level4/5)</td>
</tr>
</tbody>
</table>
Opening Plenary Session at the Europa Hall

08:30 Welcome
Univ.-Prof. Dr. rer. nat. Dr. h.c. mult.
Ulrich Rüdiger
Rector, RWTH Aachen University

08:40 Introduction to the 30th Aachen Colloquium
Univ.-Prof. Dr.-Ing.
Stefan Pischinger
Director, VKA, RWTH Aachen University
Univ.-Prof. Dr.-Ing.
Lutz Eckstein
Director, ika, RWTH Aachen University

09:00 Electromobility – Opportunity and Driver for Growth
Dipl.-Ing.
Markus Duesmann
Chairman of the Board of Management and Board of Management Member for Product Lines at AUDI AG

09:20 Future of Mobility
Dr.-Ing.
Stefan Hartung
Member of the Board of Management, Robert Bosch GmbH

09:40 Plenary Discussion
### Technical Presentations Program Tuesday, October 5th, 2021 Session 1

**Session Chair**
- **Prof. Dr. Henning Wallentowitz**
  ika, RWTH Aachen University
- **Dr. Jens Kotte**
  fka GmbH
- **Dr. Christoph Menne**
  FEV Europe GmbH
- **Prof. Andre Seeck**
  Bundesanstalt für Straßenwesen (BASt)
- **Univ.-Prof. Dr.-Ing. Christian Schindler**
  ifs, RWTH Aachen University

#### Battery Systems
- **Ultra-Fast Charging Urban Delivery Vehicles**
  - M. Bassett, J. Hall – MAHLE Powertrain Ltd.
  - P. Wilson – Allotrope Energy Ltd.
- **Future Battery Systems – Affordable, Safe and Highly Integrated**
  - M. Teuber, M. Stapelbroek – FEV Europe GmbH
  - C. Kurten, O. Lück – FEV Vehicle GmbH
- **Next Generation Batteries for Mobility in Korea: Technical Trends, Patent Filings and Legal Issues**
  - I.-C. Kwon, S.-E. Kim – Kim & Chang

#### Automotive Strategy Concepts I
- **Mobile Phones on Four Wheels – How OEMs and Suppliers can Win the Race for Software Domination**
  - C. Koehler, A. Neumann – Strategy Engineers GmbH & Co. KG
- **Future Automotive Value Creation Strategies**
  - J. Berking, S. Schnurrer, M. Gavrilu, B. Schoenberger, S. Rengarajan – Oliver Wyman

#### Thermal Management
- **Multiphysics Design and Analysis of Electric Vehicles**
  - W. Seeley, K. Illa, K. Voonna, F. Ross – Siemens Digital Industries Software
- **Integrated Thermal Management System for BEV**
  - L. Art, M. Boger, M. Jung, H. Ulrich – MAHLE Behr GmbH & Co. KG

#### Automated Driving – Architecture & Impact
- **UNICARagil – Architectures for Automated Driving - First Results**
  - R. van Kempen, T. Woopen, L. Eckstein – ika, RWTH Aachen University
- **Integration of a Vehicle Operating Mode Management into UNICARagil’s Automotive Service Oriented Architecture**
  - J. Jatzkowski, T. Stolte – TU Braunschweig
  - M. Buchholz, K. Dietmayer – Ulm University
  - A. Kampmann – RWTH Aachen University

#### Chassis – Virtual Development Methods
- **Systematic Integration of Simulation and Driving Test to Evaluate Rollover Behavior of SUVs**
  - F. Chang, M. Frost, C. Schimmels – AUDI AG
- **Categorization of Single Obstacles Regarding to Vehicle Vertical Dynamics and Subjective Human Perception**
  - J. Kreibich, L. Mahlknecht – TU München
  - A. Noll – AUDI AG
  - K. Riedl – Volkswagen AG

#### Overview Presentations Information
- **Session Chair**
- **Presentation Information**
Technical Presentations Program Tuesday, October 5th, 2021 Session 2

### Fuel Cells I

**Europa**
- **Toyota's Strategy for Fuel Cell Technology and the Progress in the Second Generation Mirai**
  - T. Paquet – Toyota Motor Europe

**Berlin**
- **Life Cycle Assessment of Electric Vehicles, Methodology and Result**
  - R. Palm, I. Råde, C. Krewer, K.-H. Hagdahl, A. Egeskog – Volvo Cars
  - L. Bolin – Polestar
  - L. Dahllöf – IVL Swedish Environmental Research Institute

### Life Cycle Assessment

**Lissabon**
- **New CVT Products, Valuable Solutions for the Diversified Powertrain Future**
  - G.-j. Van Spijk, F. Van der Sluis, L. Romers – Bosch Transmission Technology
  - Z. Cai – Bosch Trading (Shanghai) Co. Ltd.

### Transmission Concepts for Electrified Drives

**Brüssel**
- **LiDAR for Increasing Safety and Comfort**
  - K. Bronowski – XenomatiX

### Sensor Technologies for Automated Driving

**K1 Aachen**
- **Operating Strategy for Autonomous Vehicles in Case of Failures in the Brake**
  - C. Schlimme – Volkswagen AG
  - J. Iatropoulos, J. Sterthoff, R. Henze – IfF, TU Braunschweig

### Brake Systems

**Europa**
- **Hydrogen Powertrain Designs for European Long-Haul Trucks**
  - K. Godard – Symbio
  - G. Queney – Faurecia

**Berlin**
- **Modular Propulsion System Design as Cornerstone for Agility for Global Electrified Platforms**
  - G. Bismans – Punch Powertrain

**Lissabon**
- **LiDAR Sensor Calibration Without the Use of Physical Objects**
  - A. Engelbert, J. Poppe – HORIBA Europe GmbH
  - H.-J. Mäurer – DEKRA SE

**Brüssel**
- **How to Build a Highly Accurate Digital Twin – Intelligent Infrastructure in the Corridor for New Mobility – ACCorD**
  - L. Kloeker, A. Kloeker, J. Hemsen

**K1 Aachen**
- **LiDAR Sensor for Autonomous Driving and Smart Cities – A Summery of First Real World Applications**
  - Y. Ji – LiangDao GmbH

---

**Program booklet 30th Aachen Colloquium**

**Technical Presentations Program**
# Technical Presentations Program

**Tuesday, October 5th, 2021 Session 3**

## Overview

### Presentations

### Information

### Technical Presentations Program

<table>
<thead>
<tr>
<th>Session Chair</th>
<th>Subject</th>
<th>Details</th>
</tr>
</thead>
</table>
| Prof. Dr.-Ing. Michael Bargende | IFS, University of Stuttgart | Zero Impact Emission Concepts
| Dr. Johannes Scharf | FEV Europe GmbH | Battery Cooling
| Prof. Dr. Thomas Koch | Karlsruher Institut für Technologie | Heavy Duty Emission Concepts
| Prof. Peter Urban | ika, RWTH Aachen University | Mobility & Vehicle Concepts I
| Prof. Dr. Ferit Küçükay | IF, TU Braunschweig | Chassis Systems

### Europa

- **Zero Impact Emission Concepts**
  - Afttreatment Technologies Supporting the Path Towards Zero-Impact Emissions
    - D. Rose, T. Bager, F. Jung – Corning GmbH
    - T. A. Collins, R. I. Ogunwumi – Corning Inc.
  - Zero Impact Pollutant Emissions and 50 % Real-World Efficiency – The Future of CI Powertrains
    - C. Menne – FEV Europe GmbH
    - T. Körfer, D. van der Put, M. Mütter, H. Busch – FEV Group GmbH

- **Battery Cooling**
  - How Battery Pack Safety can be Improved with an Innovative Fluid for Thermal Management
    - N. Champagne – TOTAL

- **Heavy Duty Emission Concepts**
  - Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines
    - C. Webb, P. Stephenson, M. Meijer, A. Coumans – Paccar Technical Center
    - J. Kramer, R. Brueck – Vitesco Technologies Emitec GmbH

### Berlin

- **Zero Impact Pollutant Emissions and 50 % Real-World Efficiency – The Future of CI Powertrains**
  - C. Menne – FEV Europe GmbH
  - T. Körfer, D. van der Put, M. Mütter, H. Busch – FEV Group GmbH

- **Battery Cooling**
  - How Battery Pack Safety can be Improved with an Innovative Fluid for Thermal Management
    - N. Champagne – TOTAL

- **Heavy Duty Emission Concepts**
  - Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines
    - C. Webb, P. Stephenson, M. Meijer, A. Coumans – Paccar Technical Center
    - J. Kramer, R. Brueck – Vitesco Technologies Emitec GmbH

### Lissabon

- **Zero Impact Pollutant Emissions and 50 % Real-World Efficiency – The Future of CI Powertrains**
  - C. Menne – FEV Europe GmbH
  - T. Körfer, D. van der Put, M. Mütter, H. Busch – FEV Group GmbH

- **Battery Cooling**
  - How Battery Pack Safety can be Improved with an Innovative Fluid for Thermal Management
    - N. Champagne – TOTAL

- **Heavy Duty Emission Concepts**
  - Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines
    - C. Webb, P. Stephenson, M. Meijer, A. Coumans – Paccar Technical Center
    - J. Kramer, R. Brueck – Vitesco Technologies Emitec GmbH

### Brüssel

- **Zero Impact Pollutant Emissions and 50 % Real-World Efficiency – The Future of CI Powertrains**
  - C. Menne – FEV Europe GmbH
  - T. Körfer, D. van der Put, M. Mütter, H. Busch – FEV Group GmbH

- **Battery Cooling**
  - How Battery Pack Safety can be Improved with an Innovative Fluid for Thermal Management
    - N. Champagne – TOTAL

- **Heavy Duty Emission Concepts**
  - Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines
    - C. Webb, P. Stephenson, M. Meijer, A. Coumans – Paccar Technical Center
    - J. Kramer, R. Brueck – Vitesco Technologies Emitec GmbH

### K1 Aachen

- **Zero Impact Pollutant Emissions and 50 % Real-World Efficiency – The Future of CI Powertrains**
  - C. Menne – FEV Europe GmbH
  - T. Körfer, D. van der Put, M. Mütter, H. Busch – FEV Group GmbH

- **Battery Cooling**
  - How Battery Pack Safety can be Improved with an Innovative Fluid for Thermal Management
    - N. Champagne – TOTAL

- **Heavy Duty Emission Concepts**
  - Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines
    - C. Webb, P. Stephenson, M. Meijer, A. Coumans – Paccar Technical Center
    - J. Kramer, R. Brueck – Vitesco Technologies Emitec GmbH

### Technical Presentations

**Technical Presentations Program Tuesday, October 5th, 2021 Session 3**

<table>
<thead>
<tr>
<th>Session Chair</th>
<th>Subject</th>
<th>Details</th>
</tr>
</thead>
</table>
| Prof. Dr.-Ing. Michael Bargende | IFS, University of Stuttgart | Zero Impact Emission Concepts
| Dr. Johannes Scharf | FEV Europe GmbH | Battery Cooling
| Prof. Dr. Thomas Koch | Karlsruher Institut für Technologie | Heavy Duty Emission Concepts
| Prof. Peter Urban | ika, RWTH Aachen University | Mobility & Vehicle Concepts I
| Prof. Dr. Ferit Küçükay | IF, TU Braunschweig | Chassis Systems

### Zero Impact Emission Concepts

- **Zero Impact Pollutant Emissions and 50 % Real-World Efficiency – The Future of CI Powertrains**
  - C. Menne – FEV Europe GmbH
  - T. Körfer, D. van der Put, M. Mütter, H. Busch – FEV Group GmbH

### Battery Cooling

- **How Battery Pack Safety can be Improved with an Innovative Fluid for Thermal Management**
  - N. Champagne – TOTAL

### Heavy Duty Emission Concepts

- **Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines**
  - C. Webb, P. Stephenson, M. Meijer, A. Coumans – Paccar Technical Center
  - J. Kramer, R. Brueck – Vitesco Technologies Emitec GmbH

### Mobility & Vehicle Concepts I

- **Development of an Autonomous Family Vehicle using a Scenario-Based Design Approach**

### Chassis Systems

- **Steer-by-Wire – Experience, Potentials and Solutions for Future Mobility**
  - H. Hugle – Schaeffler Paravan Technologie GmbH & Co. KG
  - T. Sandmann, D. Wegener – ika GmbH

### Future Regulatory Technology Options to Reduce Risk in Application for Heavy-Duty Diesel Engines

- **Modelling of Exhaust Emissions from a PHEV Hybrid Vehicle**
  - S. Loussiaief, M. Groisil – Siemens Industry Software

- **Innovative Battery Cooling System Using Immersion Cooling for Mainstream BEV**
  - C. Rouaud – RICARDO
  - M. Lashbrook – M&I Materials Ltd.
  - S. Charmer – WMG, University of Warwick

- **Ultra-Low NOx Emissions with Close-Coupled Emission Control System on a Heavy-duty Truck Application**
  - P. Mendoza, J. Demuynck, D. Bosteels – AECC aisbl
  - T. Wilkes, L. Robb – FEV Europe GmbH

- **Participatory Development of a Mobility Station for All Ages – A Real-World-Condition Laboratory Approach**
  - P. Ziegert, T. Teich, T. Neumann, D. Kretz – Westsächsische Hochschule Zwickau
  - E. Höhne, S. Leonhardt – Stadt Zwickau

### Modular and Scalable System Integration for Electric Vehicles: The Integrated Axle Module (IAM) by BENTELER and Bosch

- **Impact of Tire Modelling on Vehicle Soiling**
  - D. Mutlyashki, T. Linden – 3DS

### Challenges for CV Powertrains Meeting Strict Future Low-Emission Regulations – Will Electrification Be the Solution?

- **A Matrix-Based Model for the Systematic Transfer of Requirements into Vehicle Modules and Functions**
  - A. Riddoch, T. Roß, A. Twer – AUDI AG
  - C. Sieg, F. Küçükay – TU Braunschweig
  - F. Mantwill – Helmut Schmidt Universität Hamburg

### Modelling of Exhaust Emissions from a PHEV Hybrid Vehicle

- **Innovative Battery Cooling System Using Immersion Cooling for Mainstream BEV**
  - C. Rouaud – RICARDO
  - M. Lashbrook – M&I Materials Ltd.
  - S. Charmer – WMG, University of Warwick

- **Ultra-Low NOx Emissions with Close-Coupled Emission Control System on a Heavy-duty Truck Application**
  - P. Mendoza, J. Demuynck, D. Bosteels – AECC aisbl
  - T. Wilkes, L. Robb – FEV Europe GmbH

### Participatory Development of a Mobility Station for All Ages – A Real-World-Condition Laboratory Approach

- **Impact of Tire Modelling on Vehicle Soiling**
  - D. Mutlyashki, T. Linden – 3DS
### Technical Presentations Program Wednesday, October 6th, 2021 Session 1

<table>
<thead>
<tr>
<th>Session Chair</th>
<th>Session Chair</th>
<th>Session Chair</th>
<th>Session Chair</th>
<th>Session Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univ.-Prof. Dr.-Ing. Stefan Pischinger</td>
<td>Prof. Dr. Christian Beidl</td>
<td>Dietmar Goericke</td>
<td>Prof. Dr. Jakob Andert</td>
<td>Prof. Dr. Verena Nitsch</td>
</tr>
<tr>
<td>VKA, RWTH Aachen University</td>
<td>vkm, TU Darmstadt</td>
<td>FVV e.V.</td>
<td>VKA, RWTH Aachen University</td>
<td>IAW, RWTH Aachen University</td>
</tr>
</tbody>
</table>

#### Hybrid & Range-Extender-Concepts

<table>
<thead>
<tr>
<th>Location</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europa</td>
<td>The Fourth Generation Plug-In Hybrids at Mercedes-Benz. An Important Milestone on the Way to Transformation</td>
</tr>
<tr>
<td>Brüssel</td>
<td>Design Aspects of Electric Traction Drives using the Example of an 800 V System</td>
</tr>
<tr>
<td>K1 Aachen</td>
<td>Human-Machine-Interaction Safety of Level 2 Systems: Development of a Performance-Based Test and Assessment Procedure</td>
</tr>
</tbody>
</table>

#### Application of Alternative Fuels

<table>
<thead>
<tr>
<th>Location</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lissabon</td>
<td>ICE2025+: Ultimate System Efficiency</td>
</tr>
</tbody>
</table>

#### Reports from FVV-Projects

<table>
<thead>
<tr>
<th>Location</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brüssel</td>
<td>Cathode Air Quality Requirements for LT-PEM Fuel Cells</td>
</tr>
<tr>
<td>K1 Aachen</td>
<td>Optimizing Electric Motor Controls with Dynamic Motor Drive</td>
</tr>
</tbody>
</table>

#### Electric Motors

<table>
<thead>
<tr>
<th>Location</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brüssel</td>
<td>ICE2025+: Ultimate System Efficiency</td>
</tr>
</tbody>
</table>

#### HMI & User Experience

<table>
<thead>
<tr>
<th>Location</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lissabon</td>
<td>Cathode Air Quality Requirements for LT-PEM Fuel Cells</td>
</tr>
<tr>
<td>Brüssel</td>
<td>Optimizing Electric Motor Controls with Dynamic Motor Drive</td>
</tr>
<tr>
<td>K1 Aachen</td>
<td>Efficient Warning Systems: Effects of the Proximity of Audio Warnings on Driving Behaviour</td>
</tr>
</tbody>
</table>
## Technical Presentations Program

Wednesday, October 6th, 2021

### Session 2

<table>
<thead>
<tr>
<th>Session Chair</th>
<th>Session Chair</th>
<th>Session Chair</th>
<th>Session Chair</th>
<th>Session Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter Eilts, TU Braunschweig</td>
<td>Dirk Adamczyk, ZF Friedrichshafen AG</td>
<td>Prof. Dr. Bernhard Geringer, TU Wien</td>
<td>Dieter Moormann, FSD, RWTH Aachen University</td>
<td>Dr. Norbert W. Alt, FEV Group GmbH</td>
</tr>
</tbody>
</table>

### New Engine Technologies

**Europa**
- **Weight Reduction and Functional Improvement of Future ICEs with Additive Manufacturing and Composite Materials**

**Berlin**
- **Battery vs. Fuel Cell**
  - M. Baum, W. Bernhart, C.-S. Ernst – Roland Berger GmbH

**Lissabon**
- **Air Management for Fuel Cells: Key for Long-Term Durability**
  - P. Geskes, S. Biba, M. Baumann, M. Berger – MAHLE Filtersysteme GmbH

**Brüssel**
- **Waymo Safety Assurance**
  - T. Victor – Waymo LLC

**K1 Aachen**
- **Positive Risk Balance as a Maxim for a Safety Oriented Development of Automated Driving**
  - N. Kauffmann, F. Fahrenkrog, L. Drees, F. Raisch – BMW Group

### Automotive Strategy Concepts II

**Europe**
- **Strategies for the Electrification of Commercial Vehicles**
  - C. Foltz, J. Neuhausen, F. Andre, A. Wild – PwC Strategy& (Germany) GmbH

**Berlin**
- **Fuel Cell Air Compressor Design**
  - J. Klütsch – VKA, RWTH Aachen University

**Lissabon**
- **Fuel Cell for Sustainable Mobility – The Compressor as a Key Technology for Efficient and Cost Optimized Systems**
  - M. Walters, D. Lückmann, A. Schloßhauer – FEV Europe GmbH

**Brüssel**
- **Testing for Tactical Safety of Autonomous Vehicles**
  - H.-P. Schöner – IFO-Consulting

**K1 Aachen**
- **DENSOs Novel Development Approach for Power Electronics and its Control**
  - R. Klink, D. Heintges, S. Aleff – DENSO AUTOMOTIVE Deutschland GmbH

### Fuel Cells II

**Europa**
- **Vehicle Cost Analysis for Road Vehicles until 2050**
  - S. Kraus, J. Reul, T. Grube, D. Stolten – Forschungszentrum Jülich GmbH

**Berlin**
- **Fuel Cell for Sustainable Mobility – The Compressor as a Key Technology for Efficient and Cost Optimized Systems**
  - S. Schnorpfeil, C. Glahn, E. Hartmann, H. Soetje – SEGULA Technologies GmbH

**Lissabon**
- **Predictive and Heat-managed Operating Strategy for a Fuel Cell Electric Vehicle**
  - M. Pietruck, C. Massonet, D. Backes, L. Eckstein – ika, RWTH Aachen University

**Brüssel**
- **A Needle in a Haystack – How to Derive Relevant Scenarios for Testing Automated Driving Systems in Urban Areas**
  - N. Weber – Opel Automobile GmbH

**K1 Aachen**
- **Wide-Bandgap SiC Semiconductors – Advantages and Limitations in EV Drive Applications**
  - M. Schubert – Leadrive Technology Germany GmbH

### Verification & Validation of Automated Driving

**Europa**
- **Research on Swirl Induced Lean Spark Assisted Compression Ignition of Gasoline**

**Berlin**
- **Waymo Safety Assurance**
  - T. Victor – Waymo LLC

**Lissabon**
- **Positive Risk Balance as a Maxim for a Safety Oriented Development of Automated Driving**
  - N. Kauffmann, F. Fahrenkrog, L. Drees, F. Raisch – BMW Group

**Brüssel**
- **Testing for Tactical Safety of Autonomous Vehicles**
  - H.-P. Schöner – IFO-Consulting

**K1 Aachen**
- **DENSOs Novel Development Approach for Power Electronics and its Control**
  - R. Klink, D. Heintges, S. Aleff – DENSO AUTOMOTIVE Deutschland GmbH

### Power Electronics

**Europa**
- **Battery vs. Fuel Cell**
  - M. Baum, W. Bernhart, C.-S. Ernst – Roland Berger GmbH

**Berlin**
- **Air Management for Fuel Cells: Key for Long-Term Durability**
  - P. Geskes, S. Biba, M. Baumann, M. Berger – MAHLE Filtersysteme GmbH

**Lissabon**
- **Fuel Cell for Sustainable Mobility – The Compressor as a Key Technology for Efficient and Cost Optimized Systems**
  - M. Walters, D. Lückmann, A. Schloßhauer – FEV Europe GmbH

**Brüssel**
- **Testing for Tactical Safety of Autonomous Vehicles**
  - H.-P. Schöner – IFO-Consulting

**K1 Aachen**
- **DENSOs Novel Development Approach for Power Electronics and its Control**
  - R. Klink, D. Heintges, S. Aleff – DENSO AUTOMOTIVE Deutschland GmbH

### Technical Presentations Program

Wednesday, October 6th, 2021

**Session 2**
# Technical Presentations Program

Wednesday, October 6th, 2021  
**Session 3**

<table>
<thead>
<tr>
<th><strong>Session Chair</strong></th>
<th><strong>Overview</strong></th>
</tr>
</thead>
</table>
| **Prof. Helmut Eichlseder**  
TU Graz | **Technical Presentations Program** |
| **Prof. Hans-Christian Reuss**  
IFS, Universität Stuttgart | |
| **Dr. Rupert Niethammer**  
Daimler Truck AG | |
| **Univ.-Prof. Dr.-Ing. Stefan Kwalewski**  
I11, RWTH Aachen University | |
| **Univ.-Prof. Dr.-Ing. Tobias Kuhnimhof**  
isb, RWTH Aachen University | |

### Hydrogen Combustion Engines

- **Europa**
  - **PUNCH H2-ICE & Flybrid KERS for Decarbonizing Off-Highway Applications**  
  - S. Scalabrini – PUNCH Hydrocells

- **Berlin**
  - **The Hydrogen Combustion Engine as Zero Impact Emission Powertrain Concept**  
  - V. Huth, L. Virnich, A. Pfortje – FEV Europe GmbH  
  - S. Sterlepper, S. Pischinger – VKA, RWTH Aachen University  
  - T. Wolff, A. Moreno, E. Georgiadis – Dinex A/S

- **Lissabon**
  - **Valve Train System for P0 and P1 Hybrid Powertrains**  

- **Brüssel**
  - **Hydrogen Combustion Engine for Commercial Vehicle Applications – New Requirements for Combustion Simulation**  
  - T. Ebert, R.-F. Nobile, D. Leimann – KEYOU GmbH

### 48V Technologies

- **Europa**
  - **Mild Hybrid Solutions, Concepts and CO2 Effects**  
  - G. Cariccia, S. Brandin – DAYCO EUROPE SRL  
  - A. Tonoli – Politecnico di Turin

- **Berlin**
  - **Design of an Electric Drive Axle for Heavy Distribution Traffic**  
  - R. Uerlich, S. Köller, L. Eckstein – ika, RWTH Aachen University  
  - C. Westphahl – WZL, RWTH Aachen University

- **Lissabon**
  - **Valve Train System for P0 and P1 Hybrid Powertrains**  

- **Brüssel**
  - **Scalable Approach for 48 V and E-Drives**  
  - M. Uhl, R. Peck, R. Benz, C. Hözl – SEG Automotive Germany GmbH

### Commercial Vehicle & All-Wheel Drive Technologies

- **Europa**
  - **Heavy Duty Vehicles for Sustainable Transport**  
  - G. Sandkühler – FAUN Umwelttechnik GmbH & Co. KG

- **Berlin**
  - **Heavy Duty Vehicles for Sustainable Transport**  
  - G. Sandkühler – FAUN Umwelttechnik GmbH & Co. KG

- **Lissabon**
  - **GKN’s Highly Efficient Components for Future AWD**  

- **Brüssel**
  - **Automated Statistical Validation using Big Data**  

### Data for Automated Driving

- **Europa**
  - **Learning Delta Policies for Automated Driving via Reinforcement Learning**  
  - M. Templer, J. Kaste, P. Hochrein, B. Mennenga – Volkswagen AG

- **Berlin**
  - **Highly Accurate Scenario and Reference Data for Automated Driving**  
  - L. Vater, R. Krajewski, L. Eckstein – ika, RWTH Aachen University  
  - T. Moers, J. Bock – ika GmbH

- **Lissabon**
  - **Info Bee at UNICARagil: Airborne Support for Automated Driving**  
  - N. Vogel, D. Moormann – fsd, RWTH Aachen University  
  - J. Holstein, N. Siepenkötter – flyXdrive GmbH

- **Brüssel**
  - **Automated Statistical Validation using Big Data**  

### Mobility & Vehicle Concepts II

- **Europa**
  - **EDAG CityBot Ecosystem: A Holistic Mobility System for the Smart City of Tomorrow**  
  - J. Barckmann – EDAG

- **Berlin**
  - **UrbANT – An Autonomous Delivery Robot for the Last Mile**  
  - M. Reske, M. Daher, P. Dautzenberg, T. Lennartz, L. Eckstein – ika, RWTH Aachen University

- **Lissabon**
  - **UrbANT – An Autonomous Delivery Robot for the Last Mile**  
  - M. Reske, M. Daher, P. Dautzenberg, T. Lennartz, L. Eckstein – ika, RWTH Aachen University

- **Brüssel**
  - **Automated Statistical Validation using Big Data**  

- **K1 Aachen**
  - **EDAG CityBot Ecosystem: A Holistic Mobility System for the Smart City of Tomorrow**  
  - J. Barckmann – EDAG
Closing Plenary Session in the Europa Hall

16:00 What it Takes to Make Cars More Intelligent
Prof. Dr.
Ralf G. Herrtwich
Senior Director Automotive Software, NVIDIA, Berlin

16:20 Mobis, a Reliable Partner to Share the Future Vision of EV
Dr.
Byung-Ki Ahn
Senior Vice President Electric Powertrain BU, R&D Division Hyundai MOBIS, Korea

16:40 Plenary Discussion

17:00 Closing Address
Univ.-Prof. Dr.-Ing.
Stefan Pischinger
Director, VKA, RWTH Aachen University

Univ.-Prof. Dr.-Ing.
Lutz Eckstein
Director, ika, RWTH Aachen University

17:15 End of Colloquium
SAVE THE DATE
5th INTERNATIONAL CONFERENCE
ZERO CO₂ MOBILITY
NOVEMBER 16–17, 2021

We support you with our expertise in the development of alternative powertrain concepts

Your engineering partner for:
> Complete and partial electrification of powertrains
> Battery technology and battery management systems
> Hydrogen fuel cells
> Hydrogen internal combustion engines
> CO₂-neutral and regenerative fuels
> Power-to-X
> including fuels based on biomass

www.zero-co2-mobility.com
<table>
<thead>
<tr>
<th>Speaker</th>
<th>Affiliation/Company</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dirk Abel</td>
<td>IRT, RWTH Aachen University</td>
<td><a href="mailto:d.abel@irt.rwth-aachen.de">d.abel@irt.rwth-aachen.de</a></td>
</tr>
<tr>
<td>Dirk Adamczyk</td>
<td>ZF Friedrichshafen AG</td>
<td><a href="mailto:dirk.adamczyk@zf.com">dirk.adamczyk@zf.com</a></td>
</tr>
<tr>
<td>Tim Ahrendhold</td>
<td>Institut für Fahrzeugtechnik</td>
<td><a href="mailto:t.ahrenhold@tu-bs.de">t.ahrenhold@tu-bs.de</a></td>
</tr>
<tr>
<td>Norbert W. Alt</td>
<td>FEV Group GmbH</td>
<td><a href="mailto:alt@fev.com">alt@fev.com</a></td>
</tr>
<tr>
<td>Jakob Andert</td>
<td>VKA, RWTH Aachen University</td>
<td><a href="mailto:andert@vka.ruwth-aachen.de">andert@vka.ruwth-aachen.de</a></td>
</tr>
<tr>
<td>Laurent Art</td>
<td>MAHLE Behr GmbH &amp; Co. KG</td>
<td><a href="mailto:laurent.art@mahle.com">laurent.art@mahle.com</a></td>
</tr>
<tr>
<td>Johannes Barckmann</td>
<td>EDAG</td>
<td><a href="mailto:johannes.barckmann@edag.com">johannes.barckmann@edag.com</a></td>
</tr>
<tr>
<td>Michael Bargende</td>
<td>IFS, Universität Stuttgart</td>
<td><a href="mailto:michael.bargende@fkfs.de">michael.bargende@fkfs.de</a></td>
</tr>
<tr>
<td>Michael Basset</td>
<td>MAHLE Powertrain Limited</td>
<td><a href="mailto:mike.basset@mahle.com">mike.basset@mahle.com</a></td>
</tr>
<tr>
<td>Markus Baum</td>
<td>Roland Berger GmbH</td>
<td><a href="mailto:markus.baum@rolandberger.com">markus.baum@rolandberger.com</a></td>
</tr>
<tr>
<td>Christian Beidl</td>
<td>vkm, TU Darmstadt</td>
<td><a href="mailto:beidl@vkm.tu-darmstadt.de">beidl@vkm.tu-darmstadt.de</a></td>
</tr>
<tr>
<td>Johannes Berking</td>
<td>Oliver Wyman</td>
<td><a href="mailto:johannes.berking@oliverwyman.com">johannes.berking@oliverwyman.com</a></td>
</tr>
<tr>
<td>Ralf Bey</td>
<td>FEV Europe GmbH</td>
<td><a href="mailto:bey@fev.com">bey@fev.com</a></td>
</tr>
<tr>
<td>Jan-Welm Biermann</td>
<td>RWTH Aachen</td>
<td><a href="mailto:janwelm.biermann@post.rwth-aachen.de">janwelm.biermann@post.rwth-aachen.de</a></td>
</tr>
<tr>
<td>Gunther Bismans</td>
<td>Punchpowertrain</td>
<td><a href="mailto:gunther.bismans@punchpowertrain.com">gunther.bismans@punchpowertrain.com</a></td>
</tr>
<tr>
<td>Tobias Brinkmann</td>
<td>Lehr- und Forschungsgebiet für Mechatronik in mobilen Antrieben</td>
<td><a href="mailto:brinkmann@vka.ruwth-aachen.de">brinkmann@vka.ruwth-aachen.de</a></td>
</tr>
<tr>
<td>Karsten Bronowski</td>
<td>XenomatiX</td>
<td><a href="mailto:karsten.bronowski@xenomatix.com">karsten.bronowski@xenomatix.com</a></td>
</tr>
<tr>
<td>Christian Burkard</td>
<td>fka GmbH</td>
<td><a href="mailto:christian.burkard@fka.de">christian.burkard@fka.de</a></td>
</tr>
<tr>
<td>Alexander Busse</td>
<td>fka GmbH</td>
<td><a href="mailto:Alexander.Busse@fka.de">Alexander.Busse@fka.de</a></td>
</tr>
<tr>
<td>Gianluca Cariccia</td>
<td>DAYCO EUROPE SRL</td>
<td><a href="mailto:gianluca.cariccia@dayco.com">gianluca.cariccia@dayco.com</a></td>
</tr>
<tr>
<td>Christian Carstensen</td>
<td>paragon electrodrive GmbH</td>
<td><a href="mailto:christian.carstensen@paragon.ag">christian.carstensen@paragon.ag</a></td>
</tr>
<tr>
<td>Nicolas Champagne</td>
<td>TOTAL</td>
<td><a href="mailto:nicolas.champagne@total.com">nicolas.champagne@total.com</a></td>
</tr>
<tr>
<td>Fan Chang</td>
<td>AUDI AG</td>
<td><a href="mailto:fan.chang@audi.de">fan.chang@audi.de</a></td>
</tr>
<tr>
<td>Zhiqian Chen</td>
<td>Tula Technology</td>
<td><a href="mailto:chenz@tulatech.com">chenz@tulatech.com</a></td>
</tr>
<tr>
<td>Aleksandar Damyanov</td>
<td>ifa, Vienna University of Technology</td>
<td><a href="mailto:aleksandar.damyanov@ifa.tuwien.ac.at">aleksandar.damyanov@ifa.tuwien.ac.at</a></td>
</tr>
<tr>
<td>Mutlyashki Daniel</td>
<td>3DS</td>
<td><a href="mailto:dmi6@3ds.com">dmi6@3ds.com</a></td>
</tr>
<tr>
<td>Pia Sophie Charlotte Dautzenberg</td>
<td>ika, RWTH Aachen</td>
<td><a href="mailto:pia.dautzenberg@ika.ruwth-aachen.de">pia.dautzenberg@ika.ruwth-aachen.de</a></td>
</tr>
<tr>
<td>Thomas Ebert</td>
<td>KEYOU GmbH</td>
<td><a href="mailto:thomas.ebert@keyou.de">thomas.ebert@keyou.de</a></td>
</tr>
<tr>
<td>Helmut Eichlseder</td>
<td>ivt, TU Graz</td>
<td><a href="mailto:eichlseder@ivt.tugraz.at">eichlseder@ivt.tugraz.at</a></td>
</tr>
<tr>
<td>Peter Eilts</td>
<td>ivb, TU Braunschweig</td>
<td><a href="mailto:p.eilts@tu-bs.de">p.eilts@tu-bs.de</a></td>
</tr>
<tr>
<td>Andre Engelbert</td>
<td>HORIBA Europe GmbH</td>
<td><a href="mailto:andre.engelbert@horiba.com">andre.engelbert@horiba.com</a></td>
</tr>
<tr>
<td>Christian Foltz</td>
<td>PwC Strategy&amp; (Germany) GmbH</td>
<td><a href="mailto:christian.foltz@strategyand.pwc.com">christian.foltz@strategyand.pwc.com</a></td>
</tr>
<tr>
<td>Thomas Form</td>
<td>Volkswagen Commercial Vehicles</td>
<td><a href="mailto:thomas.form@volkswagen.de">thomas.form@volkswagen.de</a></td>
</tr>
<tr>
<td>Dirk Frerichs</td>
<td>Stellantis</td>
<td><a href="mailto:dirk.frerichs@stellantis.com">dirk.frerichs@stellantis.com</a></td>
</tr>
<tr>
<td>Bernhard Geringer</td>
<td>Technische Universität Wien</td>
<td><a href="mailto:bernhard.geringer@tuwien.ac.at">bernhard.geringer@tuwien.ac.at</a></td>
</tr>
</tbody>
</table>
### Overview

<table>
<thead>
<tr>
<th>Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter Geskes</td>
</tr>
<tr>
<td>MAHLE Filtersysteme GmbH</td>
</tr>
<tr>
<td><a href="mailto:peter.geskes@mahle.com">peter.geskes@mahle.com</a></td>
</tr>
<tr>
<td>Patrick Glusk</td>
</tr>
<tr>
<td>FEV Consulting GmbH</td>
</tr>
<tr>
<td><a href="mailto:glusk@fev.com">glusk@fev.com</a></td>
</tr>
<tr>
<td>Kevin Godard</td>
</tr>
<tr>
<td>Symbio</td>
</tr>
<tr>
<td><a href="mailto:kevin.godard@symbio.one">kevin.godard@symbio.one</a></td>
</tr>
<tr>
<td>Dietmar Goericke</td>
</tr>
<tr>
<td>FVV e.V.</td>
</tr>
<tr>
<td><a href="mailto:goericke@fvv-net.de">goericke@fvv-net.de</a></td>
</tr>
<tr>
<td>Jan Haupt</td>
</tr>
<tr>
<td>GKN</td>
</tr>
<tr>
<td><a href="mailto:jan.haupt@gknautomotive.com">jan.haupt@gknautomotive.com</a></td>
</tr>
<tr>
<td>Konrad Herold</td>
</tr>
<tr>
<td>FEV Europe GmbH</td>
</tr>
<tr>
<td><a href="mailto:herold_k@fev.com">herold_k@fev.com</a></td>
</tr>
<tr>
<td>Guy Hoffmann</td>
</tr>
<tr>
<td>BorgWarner Inc.</td>
</tr>
<tr>
<td><a href="mailto:GuHoffmann@borgwarner.com">GuHoffmann@borgwarner.com</a></td>
</tr>
<tr>
<td>Jeroen Hogema</td>
</tr>
<tr>
<td>TNO</td>
</tr>
<tr>
<td><a href="mailto:jeroen.hogema@tno.nl">jeroen.hogema@tno.nl</a></td>
</tr>
<tr>
<td>Michael Huber</td>
</tr>
<tr>
<td>FTG, Technische Universität Graz</td>
</tr>
<tr>
<td><a href="mailto:michael.huber@tugraz.at">michael.huber@tugraz.at</a></td>
</tr>
</tbody>
</table>

### Presentations

<table>
<thead>
<tr>
<th>Speakers &amp; Session Chairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hubert Hügle, Schaeffler Paravan Technology GmbH &amp; Co. KG</td>
</tr>
<tr>
<td><a href="mailto:Hubert.Huegle@schaeffler-paravan.de">Hubert.Huegle@schaeffler-paravan.de</a></td>
</tr>
<tr>
<td>Laurent Kloecker</td>
</tr>
<tr>
<td>ika, RWTH Aachen University</td>
</tr>
<tr>
<td><a href="mailto:laurent.kloecker@ika.rwth-aachen.de">laurent.kloecker@ika.rwth-aachen.de</a></td>
</tr>
<tr>
<td>Matthias Klöpfer</td>
</tr>
<tr>
<td>Mercedes-Benz AG</td>
</tr>
<tr>
<td><a href="mailto:matthias.kloepfer@daimler.com">matthias.kloepfer@daimler.com</a></td>
</tr>
<tr>
<td>Thomas Koch</td>
</tr>
<tr>
<td>IFKM, Karlsruher Institut für Technologie</td>
</tr>
<tr>
<td><a href="mailto:thomas.a.koch@kit.edu">thomas.a.koch@kit.edu</a></td>
</tr>
<tr>
<td>Christian Koehler</td>
</tr>
<tr>
<td>Strategy Engineers GmbH &amp; Co. KG</td>
</tr>
<tr>
<td><a href="mailto:cjk@strategyengineers.com">cjk@strategyengineers.com</a></td>
</tr>
<tr>
<td>Anna-Lena Köhler</td>
</tr>
<tr>
<td>ika, RWTH Aachen University</td>
</tr>
<tr>
<td><a href="mailto:anna-lena.koehler@ika.rwth-aachen.de">anna-lena.koehler@ika.rwth-aachen.de</a></td>
</tr>
<tr>
<td>Marco Kollmeier</td>
</tr>
<tr>
<td>Benteler Automobiltechnik GmbH</td>
</tr>
<tr>
<td><a href="mailto:marco.kollmeier@benteler.com">marco.kollmeier@benteler.com</a></td>
</tr>
<tr>
<td>Swantje Konradt</td>
</tr>
<tr>
<td>Otto-von-Guericke-Universität Magdeburg</td>
</tr>
<tr>
<td><a href="mailto:swantje.konradt@ovgu.de">swantje.konradt@ovgu.de</a></td>
</tr>
</tbody>
</table>

### Speakers & Session Chairs

<table>
<thead>
<tr>
<th>Speakers &amp; Session Chairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Klink</td>
</tr>
<tr>
<td>DENSO AUTOMOTIVE Deutschland GmbH</td>
</tr>
<tr>
<td><a href="mailto:r.klink@eu.denso.com">r.klink@eu.denso.com</a></td>
</tr>
<tr>
<td>Jens Kotte</td>
</tr>
<tr>
<td>fka GmbH</td>
</tr>
<tr>
<td><a href="mailto:jens.kotte@fka.de">jens.kotte@fka.de</a></td>
</tr>
<tr>
<td>Stefan Kowalewski</td>
</tr>
<tr>
<td>i11, RWTH Aachen University</td>
</tr>
<tr>
<td><a href="mailto:kowalewski@embedded.rwth-aachen.de">kowalewski@embedded.rwth-aachen.de</a></td>
</tr>
<tr>
<td>Jürgen Kraft</td>
</tr>
<tr>
<td>EKPO Fuel Cell Technologies</td>
</tr>
<tr>
<td><a href="mailto:Juergen.Kraft@ekpo-fuelcell.com">Juergen.Kraft@ekpo-fuelcell.com</a></td>
</tr>
<tr>
<td>Stefan Kraus</td>
</tr>
<tr>
<td>Forschungszentrum Jülich GmbH</td>
</tr>
<tr>
<td><a href="mailto:st.kraus@fz-juelich.de">st.kraus@fz-juelich.de</a></td>
</tr>
<tr>
<td>Julian Kreibich</td>
</tr>
<tr>
<td>FTM, TU München</td>
</tr>
<tr>
<td><a href="mailto:kreibich@ftm.mw.tum.de">kreibich@ftm.mw.tum.de</a></td>
</tr>
<tr>
<td>Ferit Küçükay</td>
</tr>
<tr>
<td>IFT, TU Braunschweig</td>
</tr>
<tr>
<td><a href="mailto:f.kuecuekay@tu-bs.de">f.kuecuekay@tu-bs.de</a></td>
</tr>
<tr>
<td>Tobias Kuhnimhof</td>
</tr>
<tr>
<td>isb, RWTH Aachen University</td>
</tr>
<tr>
<td><a href="mailto:kuhnimhof@isb.rwth-aachen.de">kuhnimhof@isb.rwth-aachen.de</a></td>
</tr>
<tr>
<td>Sven Kureti</td>
</tr>
<tr>
<td>IEC, TU Freiberg</td>
</tr>
<tr>
<td><a href="mailto:kureti@iec.tu-freiberg.de">kureti@iec.tu-freiberg.de</a></td>
</tr>
<tr>
<td>Lukas Laarmann</td>
</tr>
<tr>
<td>FH Aachen</td>
</tr>
<tr>
<td><a href="mailto:laarmann@fh-aachen.de">laarmann@fh-aachen.de</a></td>
</tr>
</tbody>
</table>
Andreas Lohner  
TH Köln  
andreas.lohner@th-koeln.de

Stephan Maufroy  
DENSO Automotive Deutschland  
s.maufroy@eu.denso.com

Pablo Mendoza Villafuerte  
AECC (Association for Emissions Control by Catalysts) ASIBL  
pablo.mendoza-villafuerte@aecc.eu

Christoph Menne  
FEV Europe GmbH  
Menne@fev.com

Daniel Mertens  
HMETC GmbH  
dmertens@hyundai-europe.com

Franz-Thomas Mitterer  
MAHLE ZG Transmissions GmbH  
mitterer@zg-gmbh.de

Sebastian Möller  
VIRTUAL VEHICLE research GmbH  
sebastian.moeller@v2c2.at

Dieter Moormann  
fsd, RWTH Aachen University  
moermann@fsd.rwth-aachen.de

Frédéric Nicolas  
IFP Energie Nouvelles  
frederic.nicolas@ifpen.fr

Rupert Niethammer  
Daimler Truck AG  
Rupert.Niethammer@Daimler.com

Verena Nitsch  
IAW, RWTH Aachen University  
v.nitsch@iaw.rwth-aachen.de

Rei Palm  
Volvo Car Corporation  
reipalm@volvocars.com

Marek Pavelka  
Valeo  
marek.pavelka@valeo.com

Francesco C. Pesce  
PUNCH Torino  
francesco_concetto.pesce@punchtorino.com

Maximilian Pietruck  
ika, RWTH Aachen University  
maximilian.pietruck@ika.rwth-aachen.de

Vinod Rajamani  
FH Dortmund  
vinod.rajamani@fh-dortmund.de

Martin Reske  
ika, RWTH Aachen University  
martin.reske@ika.rwth-aachen.de

Angus Riddoch  
Audi AG  
angus.riddoch@audi.de

Dominik Rose  
Corning GmbH  
rosedw@corn ing.com

Gerd Rösel  
Vitesco Technologies GmbH  
gerd.roesel@vitesco.com

Hermann Rottengruber  
IMS, Otto-von-Guericke Universität  
hermann.rottengruber@ovgu.de

Cedric Rouaud  
RICARDO  
cedric.rouaud@ricardo.com

Georg Sandkühler  
FAUN Umweltechnik GmbH & Co. KG  
georgsandkuehler@faun.com

Stefano Scalabrini  
PUNCH Hydrocells  
stefano.scalabrini@punchtorino.com

Johannes Scharf  
FEV Europe GmbH  
scharf@fev.com

Univ.-Prof. Dr.-Ing. Christian Schindler  
ifs, RWTH Aachen University  
schindler@ifs.rwth-aachen.de

Hauke Christian Schlimme  
Volkswagen AG  
hauke.christian.schlimme@volkswagen.de

Stephan Schnorpeil  
SEGULA Technologies GmbH  
stefanjohnannes.schnorpeil@segulagrp.de

Joachim Scholta  
ZSW  
joachim.scholta@zsw-bw.de

Hans-Peter Schöner  
IFO-Consulting  
hans-peter.schoener@gmx.net

Tobias Schräder  
ifr, TU Braunschweig  
schraeder@ifr.ing.tu-bs.de

Michael Schubert  
Leadrive Technology Germany GmbH  
michael.schubert@leadrive.com

Ulrich Schulmeister  
Robert Bosch GmbH  
ulrich.schulmeister@de.bosch.com
<table>
<thead>
<tr>
<th><strong>Speakers &amp; Session Chairs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview</strong></td>
</tr>
<tr>
<td><strong>Presentations</strong></td>
</tr>
</tbody>
</table>

### Overview

- **Andre Seeck**
  - Bundesanstalt für Straßenwesen
  - seeck@bast.de

- **Warren Seeley**
  - Siemens Digital Industries Software
  - warren.seeley@siemens.com

- **Mi Yeon Song**
  - HYUNDAI MOTORS
  - mysong@hyundai.com

- **Richard Tamba**
  - SYTECH
  - ric@brtcorp.com.au

- **Maximilian Templer**
  - Volkswagen AG
  - maximilian.templer1@volkswagen.de

- **Moritz Teuber**
  - FEV Europe GmbH
  - teuber_m@fev.com

- **Joachim Trumpff**
  - GETEC Getriebe Technik GmbH
  - joachim.trumpff@getec-gmbh.com

- **Yorihisa Tsuchiya**
  - Nissan Motor Co., Ltd
  - yori-tsuchiya@mail.nissan.co.jp

- **Roland Uerlich**
  - ika, RWTH Aachen University
  - roland.uerlich@ika.rwth-aachen.de

### Presentations

- **Marc Uhl**
  - SEG Automotive Germany GmbH
  - Marc.Uhl@seg-automotive.com

- **Tolga Uhlmann**
  - FEV Europe GmbH
  - uhlmann@fev.com

- **Peter Urban**
  - ika, RWTH Aachen University
  - peter.urban@ika.rwth-aachen.de

- **Christoph van der Broeck**
  - FEV Europe GmbH
  - broeck@fev.com

- **Pim van der Jagt**
  - AB Dynamics Europe GmbH
  - pim.vanderjagt@abdynamics.com

- **Raphael van Kempen**
  - ika, RWTH Aachen University
  - raphael.vankempen@ika.rwth-aachen.de

- **Gert-Jan Van Spijk**
  - Bosch Transmission Technology
  - Gert-Jan.vanSpijk@nl.bosch.com

- **Lennart Vater**
  - ika, RWTH Aachen University
  - lennart.vater@ika.rwth-aachen.de

- **Trent Victor**
  - Waymo LLC
  - trentvictor@waymo.com

### Information

- **Jonas Villforth**
  - Dr. Ing. h.c. F. Porsche AG
  - jonas.villforth1@porsche.de

- **Nicolaï Voget**
  - fsd, RWTH Aachen University
  - voget@fsd.rwth-aachen.de

- **Henning Wallentowitz**
  - ika, RWTH Aachen University
  - wallentowitz@ika.rwth-aachen.de

- **Cynthia Webb**
  - Paccar
  - Cynthia.Webb@PACCAR.com

- **Nico Weber**
  - Opel Automobile GmbH
  - nico.weber@ext.mpsa.com

- **Hendrik Weber**
  - ika, RWTH Aachen University
  - hendrik.weber@ika.rwth-aachen.de

- **Thomas Werblinski**
  - Schaeffler Technologies AG & Co. KG
  - thomas.werblinski@schaeffler.com

- **André Wiggerich**
  - Bundesanstalt für Straßenwesen (BASt)
  - wiggerich@bast.de

- **Christian Wouters**
  - VKA, RWTH Aachen University
  - wouters@vka.rwth-aachen.de

- **Kohei Yoshida**
  - Toyota Motor Corporation
  - kohei_yoshida@mail.toyota.co.jp

- **Pauline Ziegert**
  - Westsächsische Hochschule Zwickau
  - pauline.ziegert.hyv@fh-zwickau.de

- **Marius Zubel**
  - FEV Europe GmbH
  - zubel@fev.com
YOUR PARTICIPATION

TECHNICAL EXHIBITION

TRADITIONAL BANQUET

GENERAL INFORMATION

OUTLOOK 2022
Your participation at the 30th Aachen Colloquium

After last year's digital event, this year's colloquium is planned as a face-to-face event at the Eurogress Aachen. We are confident that the regulations will allow an event in Aachen in October 2021. The current developments of the Corona pandemic will be taken into account in the planning and the program items will be adapted accordingly.

This digital program booklet will therefore be continuously updated and supplemented with news. The most recent version is always available on our website.

Participant registration is possible on our website from June 7th, 2021. We recommend an early registration.

The organizing team is happy to answer your questions regarding your participation. We are looking forward to a successful Colloquium!

✉️ info@aachen-colloquium.com
Exhibitior List – Ground level

01 DENSO AUTOMOTIVE Deutschland GmbH
02 MAHLE GmbH
03 Faurecia
04 FEV Europe GmbH
05 iwis motorsysteme GmbH & Co. KG
06 Tenneco
07 Ricardo
08a E motors
09 Gates Industrial Europe
10 HUSCO Automotive Europe GmbH
11 HORIBA Europe GmbH
12 AVL List GmbH
13 Albonair GmbH
14 IAV
15 ElringKlinger AG
16 fka GmbH
17 innocam.NRW - Kompetenznetzwerk für automatisierte und vernetzte Mobilität NRW
18 Schaeffler Technologies AG & Co. KG
19 Felss Group GmbH
20 BorgWarner
21 M.TEC ENGINEERING GmbH
22 JB CarConcept GmbH
Exhibitior List – 1st Floor

23 Dassault Systemes Deutschland GmbH
24 FH Aachen - Faculty of Aerospace Engineering
25 ELTRO GmbH
26 IHI Hauzer Techno Coating B.V.
27 IHS Markit
28 Leadrive Technology Germany GmbH
29 Celeroton AG
30 Freudenberg Performance Materials SE & Co. KG
31 ETO GmbH
32 Springer Vieweg | Springer Fachmedien Wiesbaden GmbH
33 LEE Hydraulische Miniaturkomponenten GmbH
34 SEGULA Technologies GmbH
35 Garrett Motion
36 VEMAC GmbH & Co. KG
37 Sonceboz SA
38 Freudenberg FST GmbH
39a Aurobay
39b t.b.a
40 KAMAX Automotive GmbH
41 Miba Group
Traditional Banquet in Aachen

The traditional banquet on Tuesday evening offers culinary and musical delights in historic buildings of the city of Aachen around the Aachener market. Meet your business partners in a relaxed atmosphere to further deepen the impressions of the day together and use the opportunity to create new contacts.

For your agenda

Tuesday, October, 5th 2021

7.30pm Entrance
8.00pm Start
12th Aachen Acoustics Colloquium
Development and Research in Automotive Acoustics

November 22 – 24, 2021
Parkhotel Quellenhof Aachen, Germany

Topics

- Acoustics of Electric Drives and Hybrid Cars
- Active Sound Design and Active Components
- Drive Train Acoustics (Engine, Gearbox, Drive Shafts)
- Infotainment in the Vehicle
- Multi-Modality – Noise and Vibrations
- Numerical Methods, Simulation, Virtual Reality
- NVH Measurement, System-Analysis, Measurement Technology
- Sound Quality, Trouble-Shooting, Sound Design
- Vehicle Acoustics (Body, Mechatronic Components, Tire Road Noise)
Next year the Aachen Colloquium will take place for the 31st time. You are warmly invited to submit a lecture proposal on one of the main topics. You will find the submission form on our website from December 2021: [www.aachener-kolloquium.de](http://www.aachener-kolloquium.de)

**Important Dates**

- **Deadline for abstracts**
  - February 2022
- **Notification of the authors**
  - from April 2022
- **Deadline for submission of the manuscripts for the conference proceedings**
  - July 2022

**Main Topics for 2022**

- Alternative Fuels and High Efficiency Combustion Processes
- Automated Driving (Level 3+), Databases & AI
- Battery Systems, Management & Safety
- Vehicle Electrical Systems & 48V Technologies
- Fuel Cells
- Dedicated Hybrid Engines & Transmissions
- Chassis, Vehicle Dynamics & Tire Technology
- Electric Drive Units & Electric Motors
- Energy & Thermal Management
- Driver Assistance & Connected Driving (ADAS)
- HMI & User Experience
- Sustainable Mobility Concepts (incl. Micro Mobility)
- Sustainability, LCA & Balances
- New Vehicles, Architectures & Interior Concepts
- Commercial & Offroad Vehicle Drive Technologies
- Sensors & Perception of Environment in Vehicles and Infrastructure
- Automotive Strategies
- Zero-Impact Emission Concepts
Registration
We recommend an early registration. The terms and conditions of the Aachen Kolloquium GbR are available on the event website: https://aachener-kolloquium.de/en/terms-and-conditions-gtc.html

Procedure of Registration
1) Registration (only online via www.aachener-kolloquium.de/en)
2) Receive confirmation by e-mail
3) Wait and settle the invoice
4) Registration completion after Receipt of payment

Participation Fee
Participants 1050 € (plus VAT)
University members 525 € (plus VAT)
The participation fee includes access to the lectures, the exhibition and the banquet.

Payment Delays
In accordance with the terms and conditions, the participant fees must be paid by the due date stated on the invoice and at the beginning of the event.
Please contact us if you are unable to meet this requirement.

Conference Documents
Licences for single or multiple use of the complete conference proceedings as well as individual papers can only be ordered online via www.aachener-kolloquium.de/en/conference-documents.html.

Organizer
Aachener Kolloquium
Fahrzeug- und Motorentechnik GbR
P.O. Box 10 02 11
52002 Aachen, Germany

Scientific Management
Univ.-Prof. Dr.-Ing. Stefan Pischinger
Director VKA
RWTH Aachen University

Univ.-Prof. Dr.-Ing. Lutz Eckstein
Director ika
RWTH Aachen University

Organization
Birgit Schaefer-Hamm
Eva Kaussen
Jonas Müller
Robert Maurer
Robin Stupp
Kerstin Uhing
Janice Sievers
Michaela Wacker
Sara Portz

Contact
+49 241 8861 251 (General)
+49 241 8861 120 (Registration)
+49 241 8048 020 (Presentation Program & Technical Exhibition)
info@aachen-colloquium.com