SUSTAINABLE MOBILITY

COLLOQUIUM

AACHEN

30th Aachen Colloquium

Eurogress Aachen, Germany
October 4th-6th, 2021

Activated since early June, 2021

Registration
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
## Conference Agenda

### Monday, October 4th, 2021
18:00  Lobby: Welcome Reception & Opening of the Technical Exhibition
18:45  Poster presentations

### Tuesday, October 5th, 2021
08:30  Opening Plenary Session
10:00  Break
10:30  Battery Systems  Automotive Strategy Concepts I  Thermal Management  Automated Driving – Architecture & Impact  Chassis – Virtual Development Methods
12:00  Lunch Break
15:30  Break

### Wednesday, October 6th, 2021
08:30  Hybrid & Range-Extender-Concepts  Application of Alternative Fuels  Reports from FVV-Projects  Electric Motors  HMI & User Experience
10:00  Break
11:00  New Engine Technologies  Automotive Strategy Concepts II  Fuel Cells II  Verification & Validation of Automated Driving  Power Electronics
13:00  Lunch Break
14:00  Hydrogen Combustion Engine  48V Technologies  Commercial Vehicle & All-Wheel Drive Technologies  Data for Automated Driving  Mobility & Vehicle Concepts II
15:30  Break
16:00  Closing Plenary Session
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. 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.
Prof. Dr. Ralf G. Herrtwich  
**Senior Director Automotive Software**  
**NVIDIA**, Berlin

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  
**Senior Vice President der Electric Powertrain BU**,  
**Hyundai MOBIS**, Korea

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 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

Berlin

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

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<td>Traffic-efficient and Energy-Optimized Longitudinal Control of an Autonomous Vehicle Using Deep Reinforcement Learning</td>
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<td>Energetic Optimization of a PEM Fuel Cell Vehicle</td>
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<th>Pia Sophie Charlotte Dautzenberg, ika, RWTH Aachen</th>
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<td>Identification and Evaluation of Trust-Related Driving Situation Factors for Automated Driving (SAE Level4/5)</td>
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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

### Battery Systems

#### Europa
- **Ultra-Fast Charging Urban Delivery Vehicles**
  - M. Bassett, J. Hall – MAHLE Powertrain Ltd.
  - P. Wilson – Allotrope Energy Ltd.

#### Berlin
- **Future Battery Systems – Affordable, Safe and Highly Integrated**
  - M. Teuber, M. Stapelbroek, R. Beykirch – FEV Europe GmbH
  - C. Kürten, O. Lück, H. Wenzel – FEV Vehicle GmbH

#### Lissabon
- **Future Automotive Value Creation Strategies**
  - J. Berking, S. Schnurrer, M. Gavrila, B. Schoenberner – Oliver Wyman

#### Brüssel
- **Integrated Thermal Management System for Battery Electric Vehicles (BEV)**
  - L. Art, M. Boger, M. Jung – MAHLE Behr GmbH & Co. KG

#### K1 Aachen
- **Next Generation Batteries for Mobility in Korea: Technical Trends, Patent Filings and Legal Issues**
  - S.-E. Kim, I.A. Kwon – Kim & Chang

### Overview Presentations

- **Technical Presentations Program**
  - 10:30 – 11:00
  - **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, R. Beykirch – FEV Europe GmbH
    - C. Kürten, O. Lück, H. Wenzel – FEV Vehicle GmbH
  - **Future Automotive Value Creation Strategies**
    - J. Berking, S. Schnurrer, M. Gavrila, B. Schoenberner – Oliver Wyman
  - **Integrated Thermal Management System for Battery Electric Vehicles (BEV)**
    - L. Art, M. Boger, M. Jung – MAHLE Behr GmbH & Co. KG
  - **Next Generation Batteries for Mobility in Korea: Technical Trends, Patent Filings and Legal Issues**
    - S.-E. Kim, I.A. Kwon – Kim & Chang

### 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
- **Prof. Andre Seeck**
  - Bundesanstalt für Straßenwesen (BAST)
- **Univ.-Prof. Dr.-Ing. Christian Schindler**
  - ifs, RWTH Aachen University

### Technical Presentations

- **Self-Adapting Comfort Models for Comfort-Based HVAC Control**
  - S. Möller, A. Rauch, A. Kospach, M. Waltenberger – ika GmbH
  - L. Eckstein – RWTH Aachen University

- **The L3Pilot Impact Assessment**
  - H. Weber, J. Hiller, L. Eckstein – ika, RWTH Aachen University
  - A. Zlocki – fka GmbH

- **Systematic Integration of Simulation and Driving Test to Evaluate Rollover Behavior of SUVs**
  - F. Chang, M. Frost, C. Schimmel – AUDI AG

- **Frequency-Dependent Categorization of Vehicle Vertical Dynamics with Regard to Subjective Human Perception**
  - J. Kreibich, L. Mahlknecht m. Lienkamp – TU München
  - K. Riedel – CARIAD SE
  - A. Noll – AUDI AG

- **Model Based Quality Management for Virtual Prototypes considering Uncertainties**
  - D. Frerichs, S. Schultz, K. M. Hahn, S. David – Stellantis
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. Hayashi, T. Paquet – Toyota Motor Europe

- **Hydrogen Powertrain Designs for European Long-Haul Trucks**
  K. Godard, L. Chauvin, C. Vacquier, T. Justin – Symbio
  G. Queney – Faurecia

**Berlin**

- **Life Cycle Assessment of Electric Vehicles**
  M. Y. Song, W. B. Lee, J. W. Choung – Hyundai Motors
  D. H. Kim, G. Han, T. Hur – Konkuk University

**Lissabon**

- **Modular Propulsion System Design as Cornerstone for Agility for Global Electrified Platforms**
  K. Smolders, S. Heeren, G. Bisms – Punch Powertrain

**Brüssel**

- **LiDAR Sensor Calibration without the Need of Physical Targets**
  A. Engelbert, J. Poppe – HORIBA Europe GmbH
  T. Ost – DEKRA SE

**K1 Aachen**

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

**Life Cycle Assessment**

**Europa**

- **The Carbon Footprint of Volvo XC40 BEV and ICE – Presented With Transparency**
  R. Palm, I. Råde, C. Krewer, K.-H. Hagdahl, A. Egeskog – Volvo Cars
  L. Bolin – Polestar
  L. Dahllof – NL Swedish Environmental Research Institute

**Berlin**

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

**Lissabon**

- **LiDAR for Increasing Safety and Comfort**
  K. Bronowski, F. Geuens, K. De Meester – XenomatiX

**Brüssel**

- **LiDAR Sensor Calibration without the Need of Physical Targets**
  A. Engelbert, J. Poppe – HORIBA Europe GmbH
  T. Ost – DEKRA SE

**K1 Aachen**

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

**Transmission Concepts for Electrified Drives**

**Berlin**

- **Holistic Evaluation of Components & Systems for xEV – Life Cycle Assessment as Decisive Factor in the Innovation and Development Process?**
  A. Busse – ika, RWTH Aachen University
  M. Schmitz – VKA, RWTH Aachen University

**Lissabon**

- **Development of a Shiftable High-Speed E-Drive with a Complex-Compound Planetary Gear Set**
  F.-T. Mitterer, R. Subramanian – MAHLE ZG Transmissions GmbH
  G. Witham, J. Hemsen – ika, RWTH Aachen University

**Brüssel**

- **How to Build a Highly Accurate Digital Twin – Intelligent Infrastructure in the Corridor for New Mobility – ACCorD**
  L. Kloeker, A. Kloeker, L. Eckstein – ika, RWTH Aachen University

**K1 Aachen**

- **Accuracy Requirements for the Road Friction Coefficient Estimation of a Friction-adaptive Automatic Emergency Brake (AEB)**

**Sensor Technologies for Automated Driving**

**Berlin**

- **Green NCAP, Evaluation of the Exhaust Gas Behaviour and the Energy Efficiency of Modern Cars under Demanding Conditions**
  A. Damyanov – Vienna University of Technology
  U. Ellmers – Federal Highway Research Institute (BASi)

**Lissabon**

- **2DHT – The Answer to Highest Requirements on Sustainable Drivetrains for HEV/PHEV**
  J. Trumpff – GETEC Getriebe Technik GmbH

**Brüssel**

- **Real-Time Traffic Environment Perception by Using LiDAR Sensors and AI Software**
  Y. Ji, F. Frauendorfer – LiangDao GmbH

**K1 Aachen**

- **Brake Wear Particle Emissions – An Emerging Challenge**
  M. Huber, P. Fischer – FTG, TU Graz
  G. Steiner, A. Mamakos, A. Klug, G. Steiner – AVL List GmbH
Technical Presentations Program Tuesday, October 5th, 2021

Session Chair: Prof. Dr.-Ing. Michael Bargende
IFS, University of Stuttgart

Session Chair: Dr. Johannes Scharf
FEV Europe GmbH

Session Chair: Prof. Dr. Thomas Koch
Karlsruhe Institute of Technology

Session Chair: Prof. Dr. Peter Urban
ika, RWTH Aachen University

Session Chair: Prof. Dr.-Ing. Stefan Gies

SUSTAINABLE MOBILITY COLLOQUIUM AACHEN 30

Overview Presentations Information

Technical Presentations Program

Zero Impact Emission Concepts

Zero Impact Emission Concepts

Battery Cooling

Heavy Duty Emission Concepts

Mobility & Vehicle Concepts I

Chassis Systems

Europa

Berlin

Lissabon

Brüssel

K1 Aachen

16:30

17:00

17:30

Aftertreatment Technologies Supporting the Path Towards Zero-Impact Emissions
D. Rose, T. Bager, P. Nicolin, F. Jung – Corning GmbH
T. A. Collins, R. I. Ogunwumi – Corning Inc.

Thermal Management System Tipping Points for High Power Charging of Battery Electric Vehicles
J. Wong, R. Pearson, J. Saikeld – bp
T. Rachow, D. Schwarzmüller – Bosch

Innovative Battery Cooling System Using Immersion Cooling for Mainstream BEV
C. Rouaud – RICARDO
M. Ashbrook – 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 asbl
T. Wilkes, L. Robb, P. Recker – FEV Europe GmbH

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D-52074 Aachen

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info@aachen-colloquium.org
www.aachen-colloquium.org
## Technical Presentations Program Wednesday, October 6th, 2021 Session 1

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<td>The Fourth Generation Plug-In Hybrids Drives at Mercedes-Benz. An Important Milestone on the Road to Transformation</td>
<td>M. Klöpfer – Mercedes-Benz AG</td>
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<td><strong>Application of Alternative Fuels</strong></td>
<td>Prediction and Simulation of Cold Start Emission Behavior using eFuels</td>
<td>J. Villforth, A. C. Kulzer, H.-P. Deeg – Dr. Ing. h.c. F. Porsche AG M. Bargende – Universität Stuttgart</td>
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<tr>
<td><strong>Electric Motors</strong></td>
<td>Design Aspects of Electric Traction Drives Using the Example of an 800 V System</td>
<td>C. Carstensen, C. Neuhaus, M. Heger – paragon electrodrive GmbH</td>
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<td><strong>HMI &amp; User Experience</strong></td>
<td>Human-Machine-Interaction Safety of Level 2 Systems: Development of a Performance-Based Test and Assessment Procedure</td>
<td>A. Wiggerich – Bundesanstalt für Straßenwesen (BAST)</td>
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<td><strong>Efficient Warning Systems: Effects of the Proximity of Audio Warnings on Driving Behavior</strong></td>
<td>J. Hogema – TNO</td>
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Technical Presentations Program
Wednesday, October 6th, 2021
Session 2

**New Engine Technologies**

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

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

**Lissabon**
- The Air Pathway of a Fuel Cell: Key to Durability
  - P. Geskes, S. Biba, M. Baumann, M. Berger – MAHLE Filtersysteme GmbH

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

**K1 Aachen**
- 400 V Powerelectronic for Highest Efficiency Demands

**Automotive Strategy Concepts II**

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

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

**Lissabon**
- Simulation-Driven PEM Fuel Cell Compressor Design
  - J. Klütsch – VKA, RWTH Aachen University

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

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

**Fuel Cells II**

**Europa**
- 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

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

**K1 Aachen**
- A Needle in a Haystack – How to Derive Relevant Scenarios for Testing Automated Driving Systems in Urban Areas
  - N. Weber – Opel Automobile GmbH

**Power Electronics**

**Europa**
- Additive Manufacturing of High-performance Powertrain Components
  - F. Ickinger, M. Klampfl – Dr. Ing. h. c. F. Porsche AG

**Berlin**
- Accelerate R&D Transformation: An Approach to Close the Engineering Skill Gap

**Lissabon**
- Analysis and Active Mitigation of Fatigue in Power Electronic Inverters
  - C. van der Broeck – FEV Europe GmbH

**Brüssel**
- DENSOS Novel Development Approach for Power Electronics and Controllers
  - R. Klink, D. Heintges, S. Aleff – DENSO AUTOMOTIVE Deutschland GmbH

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

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Session Chair
Peter Eilts
TU Braunschweig

Session Chair
Dirk Adamczyk,
ZF Friedrichshafen AG

Session Chair
Prof. Dr. Bernhard Geringer
TU Wien

Session Chair
Prof. Dr. Dieter Moormann
FSD, RWTH Aachen University

Session Chair
Dr. Norbert W. Alt
FEV Group GmbH

**Overview Presentations Information**

11:00

11:30

12:30

12:00
# Technical Presentations Program

**Wednesday, October 6th, 2021**

**Session 3**

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<th>Commercial Vehicle &amp; All-Wheel Drive Technologies</th>
<th>Data for Automated Driving</th>
<th>Mobility &amp; Vehicle Concepts II</th>
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**Europa**

- **14:00**
  - PUNCH H2-ICE & Flybrid KERS for Decarbonizing Off-Highway Applications
  - Valve Train System for P0 and P1 Hybrid Powertrains
  - Concept ELV² Design of an Electric Drive Axle for Heavy Distribution Traffic
  - GKN’s Highly Efficient Components for Future AWD
  - Automated Statistical Validation using Big Data

**Berlin**

- **14:30**
  - PUNCH H2-ICE & Flybrid KERS for Decarbonizing Off-Highway Applications
  - Valve Train System for P0 and P1 Hybrid Powertrains
  - Concept ELV² Design of an Electric Drive Axle for Heavy Distribution Traffic
  - GKN’s Highly Efficient Components for Future AWD
  - Automated Statistical Validation using Big Data

**Lissabon**

- **15:00**
  - PUNCH H2-ICE & Flybrid KERS for Decarbonizing Off-Highway Applications
  - Valve Train System for P0 and P1 Hybrid Powertrains
  - Concept ELV² Design of an Electric Drive Axle for Heavy Distribution Traffic
  - GKN’s Highly Efficient Components for Future AWD
  - Automated Statistical Validation using Big Data

**Brüssel**

- **15:15**
  - PUNCH H2-ICE & Flybrid KERS for Decarbonizing Off-Highway Applications
  - Valve Train System for P0 and P1 Hybrid Powertrains
  - Concept ELV² Design of an Electric Drive Axle for Heavy Distribution Traffic
  - GKN’s Highly Efficient Components for Future AWD
  - Automated Statistical Validation using Big Data

**K1 Aachen**

- **15:45**
  - PUNCH H2-ICE & Flybrid KERS for Decarbonizing Off-Highway Applications
  - Valve Train System for P0 and P1 Hybrid Powertrains
  - Concept ELV² Design of an Electric Drive Axle for Heavy Distribution Traffic
  - GKN’s Highly Efficient Components for Future AWD
  - Automated Statistical Validation using Big Data
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 xEVs
Dr.
Byung-Ki Ahn
Senior Vice President Electric Powertrain BU, 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
ZERO CO₂ MOBILITY – CONCEPTS FOR TODAY AND TOMORROW

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5th INTERNATIONAL CONFERENCE
ZERO CO₂ MOBILITY
NOVEMBER 16–17, 2021

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Overview Presentations

Overview Presentations

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Program booklet 30th Aachen Colloquium

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Your participation at the 30th Aachen Colloquium

This year we are again planning a face-to-face event at the Eurogress Aachen. Of course, we prepared a hygiene concept and follow the latest regulations to ensure a safe visit to the event. The entire presentation program, the technical exhibition and the banquet will be part of the event. Unfortunately, the test track program will not take place this year.

In addition, we are offering online participation this year, so that participants who are affected by possible travel restrictions can also attend the Aachen Colloquium. For the online event, participants will receive access to an online platform on which the lectures will be streamed live. During the lectures and the following discussion round, questions can be asked via chat. Participants can also visit the exhibitors’ pages and get in touch with them. A chat tool offers the opportunity to exchange information and network with all participants on site and online.

This digital program booklet will be continuously updated and supplemented with news. The most recent version is always available on our [website](#).

Registration for participation in Aachen and online is possible on our [website](#). 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 in Aachen and online! ✉️[info@aachen-colloquium.com](mailto:info@aachen-colloquium.com)
At this year’s technical exhibition you have the opportunity to get to know the latest mobility technologies and concepts. International companies present their innovations and are available for direct contact and exchange on site.

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 Emotors
8b Gates Industrial Europe
09 Hitachi Astemo
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
33 LEE Hydraulische Miniaturskomponenten 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 the historic buildings around the Aachener market place. 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)

www.aachen-acoustics-colloquium.com
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

**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

**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
- 31th Aachen Colloquium Sustainable Mobility: October 10th – 12th, 2022
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
Participation in Aachen:
Participants 1050 € (plus VAT)
University members 525 € (plus VAT)

Participation online:
Participants 750 € (plus VAT)
University members 375 € (plus VAT)

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

Conference Language
The lectures will be simultaneously translated into German and English. Headsets are available for free. The proceedings will be published in English only.

Conference Office
Monday, Oct. 4th, 2021 04:00pm - 07:00pm
Tuesday, Oct. 5th, 2021 07:30am - 06:00pm
Wednesday, Oct. 6th, 2021 07:30am - 05:00pm

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