Note: This document is a digital program booklet. Accordingly, it is updated regularly. The current version of this document can always be found on the Colloquium website:
https://www.aachener-kolloquium.de/en/information/program/lecture-program.html
International cooperation for sustainable mobility

In the last two years, we have all felt how important international cooperation is. Therefore, we are particularly pleased that the Aachen Colloquium Sustainable Mobility will again provide a platform for exchange for experts from all over the world. The topic of sustainability is becoming increasingly important both in everyday life and in politics. As designers of the mobility of the future, it is our responsibility to pay particular attention to sustainable solutions. Therefore, the aspect of efficiency, safety and environmental friendliness in relation to various mobility topics will be given special attention at the Aachen Colloquium.

Not only in the lecture hall, but also on the road you can experience sustainable mobility yourself. The Circus Minimus offers you the opportunity to test novel vehicle concepts and innovative operating strategies, which for example rely on the amplification of muscle power through e-motors, directly in front of the Eurogress. This will give you an insight into the current state as well as future developments of micromobility.

The 31st Aachen Colloquium Sustainable Mobility

During the event, you will have the opportunity to attend 100 expert presentations and discuss the content afterwards. The speakers will present research results and innovations from diverse fields, such as drive technologies, digitalization, automation, complete vehicle, mobility concepts and driving dynamics. In the detailed presentation overview you will find all information about the sessions.

In the opening and closing plenary sessions, high-level representatives from selected companies will provide insights into strategic and technical developments. Alain Raposo, Executive Vice President of Hyundai Motor Group, will report on the modular Power Electric strategy for sustainable EV leadership. The presentation by Hans Schep, general manager at Ford Pro, Europe, will focus on productivity acceleration for the connected and electrified age. Axel Gern, Senior Vice President of Engineering and Managing Director at Torc Europe GmbH rounds off the opening plenary session.

In the closing plenary session, Kai-Uwe Wollenhaupt, President SVOLT Europe & Vice President SVOLT Energy Technology, will then address electromobility from the perspective of a leading battery manufacturer.

In the accompanying trade exhibition, wellknown companies are waiting to welcome you and look forward to personal exchanges. You are also welcome to visit our Start-Up Area and establish contacts with young inspiring companies from the field of mobility.

At the traditional banquet you will have the opportunity to meet the participants in a sociable atmosphere in the beautiful city center of Aachen and exchange the impressions of the day.

We are very much looking forward to your participation at the 31st Aachen Colloquium Sustainable Mobility!
As Lord Mayor, I am pleased to welcome all participants of the Aachen Colloquium Sustainable Mobility in Aachen. This traditional event is hosted by Professor Pischinger and Professor Eckstein and is already taking place for the 31st time.

The city of Aachen is ideally suited as a location for scientific conferences. Cosmopolitan, located in the border triangle of Germany - Belgium - Netherlands, it presents itself internationally through its universities. It is worthwhile to cultivate scientific exchange during the day and to deepen networking in our beautiful old town in the evening.

Aachen and sustainability - that goes well together. The city of Aachen is one of the top 3 most sustainable major cities in Germany. Also mobility is an important topic for Aachen. One of the great challenges of our time is to make tomorrow’s mobility efficient, safe and environmentally friendly. We need a reduction in traffic emissions now, otherwise Germany will miss its climate targets for 2030. The trend toward “ever bigger, ever faster, ever more luxurious” will not lead us to our goal. The citizens’ need for relaxed, climate-friendly, healthy and safe transportation is great.

The topic of sustainable mobility and its contribution to sustainable climate protection is made tangible for the citizens of Aachen, for example, in the European Mobility Week.

At the Aachen Colloquium, you can learn about the latest research results and developments for sustainable mobility in 100 lectures. Discuss and use the technologies and concepts for forward-looking mobility and let us shape the path to an emission-free future together!

We are looking forward to the impulses that the Aachen Colloquium Sustainable Mobility can provide and wish you a successful event!
### Overview

#### Presentations

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### Conference Agenda

#### Monday, October 10th, 2022

- **18:00** Lobby: Welcome Reception & Opening of the Technical Exhibition

#### Tuesday, October 11th, 2022

- **08:30** Opening Plenary Session
- **10:15** Break
- **11:00** Fuel Cells I, Automotive Strategy Concepts I, Emission Concepts I, Hydrogen Combustion Engines I, Chassis – Concepts
- **14:00** Battery Systems I, Mobility & Vehicle Concepts, Sustainable Engine Concepts, Automated Driving I, Digital Twin
- **16:00** Break
- **16:30** New Gasoline Engines, Components for Thermal Management Systems, Power Electronics, Automated Driving II, Steering

#### Wednesday, October 12th, 2022

- **08:30** Hydrogen Combustion Engines II, Battery & EDU Thermal Management, Reports from FVV projects, Electric Motors, Software Engineering for the Automotive
- **10:00** Break
- **12:30** Lunch Break
- **14:00** Battery Systems II, E-Drive Systems II, Emission Concepts II, Mobility & Sustainability, Vehicle Dynamics
- **15:30** Break
- **15:40** Closing Plenary Session
Alain Raposo
Executive Vice President Electrified Propulsion Development Tech Unit (eP TU), R&D Division HYUNDAI Motor Group

After graduating from France’s INSA (National Institute of Applied Sciences) and ENSPM (National Institute of Petrol and Engines) where he specialized in engines and products of petroleum applications, Alain Raposo started his career at Renault in 1987, been mainly in charge of engine and transmission development. In 2005, he moved to Nissan to lead its powertrain efforts. From 2008 to 2017, he spearheaded powertrain strategies that maximized synergies at the Renault-Nissan Alliance. In particular, in 2014, he added EV engineering to his realm, overseeing the alliance’s efforts in electrification development.

In 2017, he moved to Groupe PSA to lead the development of electric vehicle programs at the automaker. Within a year, he became responsible for the development of powertrains, batteries and chassis for internal combustion cars and electric vehicles.

From 10/2020 he joined Hyundai Motor Group to lead Powertrain Tech Unit in R&D Division committed to prepare Energy transition and supporting Hyundai Smart Mobility Solution Provider strategy.

Hans Schep
General Manager, Ford Pro, Europe

Hans Schep is general manager, Ford Pro, Europe, the global business and brand within Ford dedicated to delivering the world’s most comprehensive suite of solutions to commercial customers of all sizes to help accelerate productivity, improve uptime and lower operating costs through connected services and work-ready gas and electric vehicles.

Appointed to this role in June 2021, after leading the commercial vehicle business in Europe since 2016, Schep leads a European team that is helping to refine customer value through the auto industry’s first standalone commercial vehicles and services business, inside Ford, and a key part of the Ford+ plan for growth. As a one-stop shop, Ford Pro provides a trusted platform of software, charging, financing and customer support to serve commercial businesses of all sizes and industries, and will help lead the transition from gas to electric vehicles.

Previously, Schep served as director, Product Marketing, Ford of Europe, beginning in February 2015. His prior Ford roles include regional director of European sales operations – responsible for marketing, sales and after-sales in North, Central and Eastern Europe, North Africa and Central Asia – and managing director, Ford Netherlands.

Schep joined Ford in 1995. He earned a master’s degree in industrial engineering and management science from Eindhoven University of Technology.
Kai-Uwe Wollenhaupt
President SVOLT Europe & Vice President SVOLT Energy Technology

As President SVOLT Europe & Vice President SVOLT Energy Technology, Kai-Uwe Wollenhaupt aims to establish the high-tech company in Europe. This includes the establishment of the organisation as well as the construction of the production sites. The graduate engineer from RWTH Aachen University has been working as a manager in the automotive sector for over 30 years. Throughout his career, Kai-Uwe Wollenhaupt has held international key positions with global responsibility at well-renowned companies such as IVECO, ThyssenKrupp, LINAMAR, and TRW.

About SVOLT:
As a global high-tech company and spin-off of the Chinese automobile manufacturer Great Wall Motors, SVOLT Energy Technology Co., Ltd. (SVOLT) produces lithium-ion batteries and battery systems for electric vehicles and energy storage systems. SVOLT’s comprehensive one-stop product portfolio includes battery cells, modules and packs as well as battery management systems and software solutions. The company combines in-depth systemic knowledge of battery systems and management with comprehensive expertise in the field of vehicle integration. SVOLT is headquartered in Jintan District, Changzhou, Jiangsu province in China. The home office of the European subsidiary SVOLT Energy Technology (Europe) GmbH is in Frankfurt am Main. SVOLT employs around 9,600 people worldwide, with 2,700 employed in research and development (R&D). In 2019, SVOLT registered over 550 patents. Learn more at en.svolt.cn | svolt-eu.com

Axel Gern
Senior Vice President of Engineering and Managing Director of Torc Europe GmbH

Since May 2022, Gern has been named senior vice president of engineering and managing director for Torc Europe at the Technology and Software Development Center in Stuttgart, Germany. Gern joins the Torc team after serving as the chief technology officer for the Daimler Truck Autonomous Technology Group, where he had a leading role in the technological strategy for the company’s SAE-Level-4 autonomous truck development. Initially, Gern was on the Daimler Truck team that investigated autonomous driving partnerships that led to the successful 2019 acquisition of a majority stake in Torc. After serving as vice president of Autonomous Driving North America in Sunnyvale, California, for Mercedes-Benz Research & Development North America, Gern joined Daimler Truck in 2018 as the technical project lead, Autonomous Trucks. Earlier he joined what was then Daimler AG in 1998 as a research and development engineer and earned successively higher-level positions in the organization. Gern studied computer science at the University of Stuttgart, focusing on software engineering, distributed artificial intelligence, and robotics, and earned his Ph.D. in 2005.
Gerrit Marx
Chief Executive Officer der IVECO Group

Gerrit Marx has more than 20 years of experience in roles of increasing importance in different locations around the world and in a variety of industrial segments, with a specific in-depth focus on automotive industries. He holds a degree in Mechanical Engineering (“Diplom Ingenieur”) and an MBA (“Diplom Kaufmann”) from RWTH Aachen University, and a Doctorate in Business Administration from Cologne University.

From 1999 to 2007, Mr Marx worked at the global consulting firm McKinsey & Company, focusing on operational improvement programmes in the automotive and aerospace industries in Europe, Brazil, and Japan. He joined Daimler AG in 2007 to head the global controlling function for vehicle and powertrain component projects, as well as market-entry / mergers and acquisitions for three truck brands in North America, Europe and Asia. This led him to the role of President and Chief Executive Officer at Daimler Trucks China in 2009 and subsequently, President of Skoda China with Volkswagen AG, overseeing imports and joint venture business relations in both roles.

In 2012 Mr Marx joined the European leadership team of Bain Capital as a member of their portfolio group, driving and leading transformational change programs. This role also encompassed due diligence and merger and acquisition activities, with specific focus on automotive and industrial assets, and also included interim roles such as Chief Executive Officer of Wittur Group, a global Tier-1 supplier to the elevator industry. Gerrit Marx joined CNH Industrial in January 2019 as President of Commercial and Specialty Vehicles.

Since the spin-off of Iveco Group from CNH Industrial on 1st January 2022, Mr Marx has served as Chief Executive Officer of the newly formed Company.

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LONDON  3 Carters Row, Hatfield Park  |  Hatfield AL9 5NB - Hertfordshire  |  uk@jbcarconcept.de  |  P +44 (0) 7402 620 730
**Poster presentations Monday, October 10th, 2022, 18:45**

| Poster 1 | Benjamin Blau, Hochschule Trier, Hochschule Trier  
Gasoline Water Direct Injection (GWDI): Optical Investigations on Fuel-Water Emulsions in the Injection System |
|-----------|-----------------------------------------------------------------------------------------------------|
| Poster 2 | Kurt Steinmetzger, Uni Heidelberg  
Evaluation of the driver's psychophysiological state based on EEG and fNIRS measurements within a driving simulator |
| Poster 3 | Anna-Lena Köhler, Institut für Kraftfahrzeuge (ika), RWTH Aachen University  
Setting Inclusion as a Standard in the Development Process: Generation of an Inclusive Concept for Mobility on Demand |
| Poster 4 | Maren Klatt, Institut für Kraftfahrzeuge (ika), RWTH Aachen University  
Citizen's Level of Acceptance of Four Different Mobility Concepts in Scope of the Project BüLaMo |
| Poster 5 | Meike Ottensmeier, Technische Universität Dresden - Institut für Automobiltechnik Dresden  
Challenges and potentials of the self-propelled, highly immersive driving simulator |
| Poster 6 | René Degen, Cologne University of Applied Sciences  
Highly Realistic Virtual Testing of Automated Driving Systems as an Opportunity to Accelerate the Mobility Revolution |
| Poster 7 | Sebastian Bollow, HTW Berlin  
Thermal Simulation of a Quick-Change Battery System |
| Poster 8 | Alexander Kies, Fraunhofer-Institut für Produktionstechnologie IPT  
Digital Twins for Sustainable Battery Production and Life Cycles |
| Poster 9 | Patricia Wessel, Lehr- und Forschungsgebiet Mechatronik in mobilen Antrieben, RWTH Aachen University  
Remote Software Updates for Advanced Driver Assistance Systems |
| Poster 10 | Moritz Jakoby, MMP RWTH Aachen University  
ePGS - The novel hybrid drive for micro vehicles |
08:30  Welcome
Univ.-Prof. Dr. rer. nat. Dr. h.c. mult.
Ulrich Rüdiger
Rector, RWTH Aachen University

08:40  Introduction to the 31st Aachen Colloquium
Univ.-Prof. Dr.-Ing.
Stefan Pischinger
Director, TME, RWTH Aachen University
Univ.-Prof. Dr.-Ing.
Lutz Eckstein
Director, ika, RWTH Aachen University

09:00  HMGs modular Power Electric Strategie for sustainable EV-Leadership
Alain Raposo
Executive Vice President Electrified Propulsion Development Tech Unit (eP TU), R&D Division, HYUNDAI Motor Group

09:20  Ford Pro: Productivity Acceleration for the Connected and Electrified Era
Hans Schep
General Manager, Ford Pro, Europa

09:40  Autonomous Trucking - Vision, Current State, and Challenges
Dr.
Axel Gern
Senior Vice President of Engineering und Managing Director der Torc Europe GmbH

10:00  Plenary discussion

Opening Plenary Session at the Europa Hall
Technical Presentations Program Tuesday, October 11th, 2022 – Session 1

11:00 Technical Presentations Program

Fuel Cells I
- **EUROPA**
  - **Berlin**
    - **Zero Carbon Cars**
      - E. Kessler - Hyundai Motor Europe Technical Center
  - **Lissabon**
    - **Hydrogen in vehicles - The multi-dimensional value of CO2 and its strategic implications**
      - A. Busse, C. Harter, I. Olschewski - fka GmbH
    - **Advanced Hardware, Controls and Calibration Solutions to Meet the Upcoming EURO 7 Legislation**
      - B. Lindemann, B. Maurer, D. Dohse - HJS Emission Technology GmbH & Co. KG

Automotive Strategy Concepts I
- **EUROPA**
  - **Berlin**
    - **Bosch's Heavy Duty Fuel Cell System**
      - The Powerpack for Long Haul Trucks
      - T. Wintrich, A. Klonczynski, A. Moritz, C. Uhr - Robert Bosch GmbH
    - **Digitalization - and then? The impact of quantum technology on Automotive and Mobility Companies**
      - W. Bernhart, A. Fey, C.-S. Ernst - Roland Berger GmbH
  - **Lissabon**
    - **Further Improvement Steps Towards High Efficient Heavy Duty Diesel Engines Contributing for Carbon Neutral Powertrains**
      - J. Weber, J. Schador, Y. Frekers, O. Herrmann - DENSO AUTOMOTIVE DEUTSCHLAND GmbH
      - Y. Tomida, T. Ono, Y. Kakehashi - DENSO CORPORATION Japan
      - S. Schönefeld, J. Rudolph, K. Deppenkemper - FEV Europe GmbH

Emission Concepts I
- **EUROPA**
  - **Berlin**
    - **FUEL CELL PROPULSION SYSTEMS for Light Commercial Vehicle application**
      - T. Johnen, C. Wieser, P. Groß, P. Willimowski - STELLANTIS / OPEL AUTOMOBILE GmbH
    - **2 years on the road powered by Fuel Cells - Hyundai XCIENT Fuel Cell**
      - E. Kessler - Hyundai Motor Europe Technical Center

Hydrogen Combustion Engines I
- **EUROPA**
  - **Berlin**
    - **Zero Carbon Cars**
      - E. Hannon, S. Nekovar - McKinsey & Company
    - **Hydrogen in vehicles - The multi-dimensional value of CO2 and its strategic implications**
      - A. Busse, C. Harter, I. Olschewski - fka GmbH
    - **Advanced Hardware, Controls and Calibration Solutions to Meet the Upcoming EURO 7 Legislation**
      - B. Lindemann, B. Maurer, D. Dohse - HJS Emission Technology GmbH & Co. KG

Chassis – Concepts
- **K1 Aachen**
  - **Comparison of Electrical Torque-Vectoring Systems for Rear-Wheel Drive Vehicles**
    - N. Gruner, F. Six, M. Jaensch - Volkswagen AG
    - M. Henke - TU Braunschweig
  - **Characteristics of Modern Motion and Stability Systems**
    - T. Raste, A. Kuhlmann, M. Jokic - Continental
  - **Extreme Cornering Performance of Integrated Drive Axle on Vehicle**

Session Chair
- Univ.-Prof. Dr.-Ing. Stefan Pischinger - RWTH Aachen University
- Dr. Jörg Leyers - ZF Friedrichshafen AG
- Prof. Dr. Christian Beidl - TU Darmstadt
- Prof. Dr. Helmut Eichlseder - TU Graz

Overview
- Presentations
- Information

Program booklet 31st Aachen Colloquium
SUSTAINABLE MOBILITY COLLOQUIUM AACHEN
Europa Berlin Lissabon Brüssel K1 Aachen
## Technical Presentations Program Tuesday, October 11th, 2022 – Session 2

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<th>Automated Driving I</th>
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<td><strong>Berlin</strong></td>
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<td><strong>Brüssel</strong></td>
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<td>Advantages of rechargeable lithium-ion battery “SCiB™” for heavy duty vehicle applications</td>
<td>Vision EQXX - electric range and efficiency on a new level</td>
<td>Solutions for CO2-free Powertrains establishing a Green Construction Site</td>
<td>Selection of Test Cases for the Verification of Automated Vehicles</td>
<td>Optimizing efficiency and range of electrified vehicles using virtual vehicle development</td>
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<td>High Power Battery Systems for Mild-Hybrids with Sodium-ion cobalt free technology</td>
<td>Chances of Shared-Mobility-Concepts in small towns</td>
<td>The sustainable engine; towards a provider of power and torque with zero resulting environmental impact</td>
<td>Assessment of automated driving's safety impact by means of the driver behavior model 'Stochastic Cognitive Model'</td>
<td>Use of Fleet Data to define Use Cases for Drive System Development of Robot Taxis</td>
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<td>Adaptable high-performance battery pack module for the niche market</td>
<td>The Hybridvelo - a Contribution for Future Short Distance Mobility</td>
<td>Electric Vehicle 2.0 and aFuels, the low cost and sustainable solution towards an emission free automotive future</td>
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<td>Univ.-Prof. Dr.-Ing. Lutz Eckstein - ika, RWTH Aachen University</td>
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<td>Prof. Dr. Christoph Stiller - KIT</td>
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<td>WSA, RWTH Aachen University</td>
<td>FEV Europe GmbH</td>
<td>FSD, RWTH Aachen University</td>
<td>Hochschule Heilbronn</td>
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### New Gasoline Engines

- **Europa**
  - New 6 cylinder petrol engine from BMW
    - R. Welzmüller, M. Wenzel, T. Sailer, M. Karl, M. Kaufmann - BMW Group

- **Berlin**
  - Development of New 2.0 L I4 Gasoline Direct Injection Engine for Hybrid

- **Lissabon**
  - SYTECH, REEV Simulation, Analysis, Development and Durability testing
    - R. Tamba, Y. Lin, G. Fountain, M. Kavarnos, J. Psonis - SYTECH Powertrain Technologies

- **Brüssel**
  - Fluid management solutions for oil cooled components in e-mobility
    - P. Geskes, S. Jauß, H. Moser - MAHLE Filtersysteme GmbH

- **K1 Aachen**
  - Analysis of development process for safety complaint Steer-by-Wire steering systems
    - M. Wescue, C. Kreis, B. Boßdorf-Zimmer - Volkswagen AG
    - C. Siemers - TU Clausthal

### Components for Thermal Management Systems

- **Europa**
  - Digital interior: Intelligent microclimate systems for energy-efficient thermal comfort
    - T. Stocker - Gentherm GmbH

- **Berlin**
  - Scalable thermal management architecture for electric motor with different power classes

- **Lissabon**
  - NanoLam Technology for efficient DC Link Capacitors
    - M. Breuer, T. Schorn, S. Schmitt, K. Grimm - Rheinmetall AG

- **Brüssel**
  - Power electronics converter electromagnetic interference model and temperature sensing for e-mobility
    - K. Li, C.-L. Radu, P. Igic, S. Faramehr - Coventry University
    - L. Mavrovounioti, P. Igic, S. Faramehr, S. Shepherd - Coventry University
    - C. van der Broeck, A. Woerndle, T. Schnorbus - FEV Europe GmbH

- **K1 Aachen**
  - Maintaining and Enhancing ADAS with Connectivity
    - S. Schwinke – Sibros Technologies, Inc.

### Power Electronics

- **Europa**
  - Partial discharging measurement to detect early insulation damage during electrical drive unit operation
    - R. Cremer - FEV CRELTEC GmbH
    - Power diagnostix System GmbH

- **Berlin**
  - Microscopic Traffic Simulation based on Three-Phase Traffic Theory for Congestion Recognition and Automated Driving
    - J. Paczia, H. Rehborn, O. Stein - Mercedes Benz AG
    - S. Klenov - Moscow Institute of Physics and Technology
    - B. Kerner, M. Schreckenberg - Universität Duisburg-Essen

- **Lissabon**
  - Architecture of a Collective Memory in UNICARagil
    - T. Woopen, B. Lampe, R. van Kempen, L. Eckstein - ika, RWTH Aachen University

- **Brüssel**
  - Implementation of a lateral driver assistance using reinforcement learning
    - L. Witt, D. Münning, H. Oschelies - Volkswagen AG
    - S. Schmidt - Otto-von-Guericke-Universität Magdeburg

- **K1 Aachen**
  - Passengers Comfort during Automated Motorway Lane Changes
    - C. Heinsath – FKFS
    - W. Krantz - IFS
    - J. Neubeck, C. Holzapfel - KFFS
    - A. Wagner - FKFS&IFS

### Automated Driving II

- **Europa**
  - Implementation of a lateral driver assistance using reinforcement learning
    - L. Witt, D. Münning, H. Oschelies - Volkswagen AG
    - S. Schmidt - Otto-von-Guericke-Universität Magdeburg
Technical Presentations Program Wednesday, October 12th, 2022 – Session 1

**Session Chair**
**Prof. Dr. Thomas Koch**
KIT

**Session Chair**
**Prof. Dr. Niklas von der Aßen**
LTT, RWTH Aachen University

**Session Chair**
**Dietmar Goericke**
FVV

**Session Chair**
**Prof. Dr. Jakob Andert**
MMP, RWTH Aachen University

**Session Chair**
**Prof. Dr. Bernhard Rumpe**
SE, RWTH Aachen University

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### Hydrogen Combustion Engines II

**Europa**

**Hydrogen Internal Combustion Engine — Zero-Impact Emission Technology for Sustainable Mobility**

**Development of combustion process and operating strategy for a low emission hydrogen engine**
G. M. Rosaria - Robert Bosch Italy

**Battery & EDU Thermal Management**

**Refrigerant cycle with PCM cold storage for battery cooling during fast charging**
A. Steiner, A. Mladek, L. Winder - VIRTUAL VEHICLE Research GmbH, R. Sonnenberger, R. Salazar-Alvar - Valeo Klimasysteme GmbH

**2-PHASE Immersion cooling System for Thermoplastic Battery Enclosures**
G. Mimberg, M. Lipperheide - Kautex Textron GmbH & CO. KG

**Reports from FVV projects**

**Requirements for zero impact vehicles**

**Electric Motors**

**Potential Powertrain Configurations to Obtain Future CO2 Goals in 2040**
T. Stoll, M. Bargende, H.-J. Berner - Institut für Fahrzeugtechnik Stuttgart, A. Geß, M. Held - Institut für Akustik und Bauphysik Stuttgart, A. Lozanovski - Siemens AG

**Software Engineering for the Automotive**

**Continuous Architecture – an agile, collaborative approach for software defined cars**
F. Beer, H. Szekely - Bosch Corporation
A. Malkovankar, S. Riediger - FEV Europe GmbH

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**Berlin**

**Thermal Integration of High-Speed Electric Machines in EDUs**

**FVV no. 1349: Influencing Wall Heat Losses in SI Engines**
J. Achenbach - TME, RWTH Aachen
D. Weßling - Universität Magdeburg
T. Fischer - FZ Jülich

**Brüssel**

**Drastic efficiency increase of electric motors based on a new high thermal-ly conductive stator slot concept**
K. Ikeda – SEI Automotive Europe
Y. Mitsugi - Sumitomi Electric Industries, V. U. Strueken - SEWS Components and Electronics Europe

**K1 Aachen**

**Series concept of an externally excited synchronous machine as a magnet-free variant to the EMR4 platform**
G. Muehlberg, N. Daun, H. Hakvoort - Vitesco Technologies

**Future Architecture and Software Design Patterns – a Predictive Strategy Towards Sustainable, Efficient, Resilient and Cross-Technology Solutions**
J. Küfen – fka GmbH

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**Program booklet 31st Aachen Colloquium**

**Technical Presentations Program**

15
## Technical Presentations Program

**Wednesday, October 12th, 2022 – Session 2**

### E-Drive - Systems I

<table>
<thead>
<tr>
<th>Location</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europa</td>
<td>Further electrification of the drives of the compact class of Mercedes-Benz</td>
<td>A. Rehberger, A. Wieler, M. May - Mercedes-Benz AG</td>
</tr>
<tr>
<td>Lissabon</td>
<td>DHT Pro - a Dedicated Hybrid Transmission Designed for Efficiency in Customer Use</td>
<td>H. Sandquist, X. Lin, I. Scholten, S. Li, J. Fu, S. Nlarcar - Geely Powertrain Research Institute</td>
</tr>
<tr>
<td>Brüssel</td>
<td>Testing the drive of tomorrow in the era of e-mobility</td>
<td>J. Trumpff - GETEC Getriebe Technik GmbH</td>
</tr>
</tbody>
</table>

### Automotive Strategy Concepts II

<table>
<thead>
<tr>
<th>Location</th>
<th>Title</th>
<th>Presenter(s)</th>
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<tbody>
<tr>
<td>Europa</td>
<td>Value Chain Wars – How to win with Electric-Vehicle Supply Chains</td>
<td>C. Koehler - Strategy Engineers GmbH &amp; Co. KG</td>
</tr>
<tr>
<td>Berlin</td>
<td>Sustainability of automotive supply chains</td>
<td>J. Berking, D. Kronenwett, S. Schnurrer, N. Bilic - Oliver Wyman</td>
</tr>
<tr>
<td>Lissabon</td>
<td>Just a few chips missing? How automotive players should strategically safeguard their semiconductor supply chain</td>
<td>T. Schadt, M. Gloger, C. Foltz - PwC Strategy &amp; (Germany) GmbH</td>
</tr>
</tbody>
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### Fuel Cells II

<table>
<thead>
<tr>
<th>Location</th>
<th>Title</th>
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<tr>
<td>Europa</td>
<td>Automated Production of High Performance PEMFC Stacks and Components According to Automotive Requirements</td>
<td>S. Schmid, F. Maier, J. Kraft, M. Götz - EKPO Fuel Cell Technologies</td>
</tr>
<tr>
<td>Brüssel</td>
<td>Machine learning approach to determine the clothing level using an IR sensor in the vehicle cabin</td>
<td>M. Liebich – IPG Automotive GmbH A. Kirmas - ika, RWTH Aachen University</td>
</tr>
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### Automated Driving III

<table>
<thead>
<tr>
<th>Location</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europa</td>
<td>From vehicle data to a holistic situation assessment - the practice-oriented KisSME approach</td>
<td>F. Hantschel, Z. Zhang - RA Consulting, D. Schmidt - Bosch Accident Research, F. Lüttner - Frauenhofer-Institut für Kurzzeitdynamik (EMI)</td>
</tr>
<tr>
<td>Lissabon</td>
<td>Simulation-based design of a handover function</td>
<td>M. Liebich – IPG Automotive GmbH</td>
</tr>
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</table>

### Controls for Thermal Management Systems

<table>
<thead>
<tr>
<th>Location</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlin</td>
<td>Sustainable Thermal Management – Focus on Electric Vehicles</td>
<td>R. Heckt, T. Haas - HANON Systems Deutschland GmbH</td>
</tr>
<tr>
<td>Lissabon</td>
<td>Simulation-based design of a handover function</td>
<td>M. Liebich – IPG Automotive GmbH</td>
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**Session Chair**
- Prof. Dr. Henning Wallentowitz - iKa, RWTH Aachen University
- Dr. Jens Kotte - fka GmbH
- Prof. Dr. Bernhard Geringer - TU Wien
- Dr. Johannes Scharf - FEV Europe GmbH

**Session Chair**
- Prof. Dr. Henning Wallentowitz - iKa, RWTH Aachen University
- Dr. Jens Kotte - fka GmbH
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- Dr. Johannes Scharf - FEV Europe GmbH
# Technical Presentations Program Wednesday, October 12th, 2022 – Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00</td>
<td>Battery Systems II</td>
<td>Europa</td>
<td>Semiconductor-based battery disconnect switch for enhanced safety in electrical vehicles</td>
<td>M. Becker, J. Oesterdiekhoff, A. Tönnemann, K. Krebber-Hortmann, D. Fuhrmann - Rheinmetall AG</td>
</tr>
<tr>
<td>15:00</td>
<td>Mobility &amp; Sustainability</td>
<td>Lissabon</td>
<td>Vehicle Dynamics</td>
<td>Green is the new cool - intensifying electrification for sustainable, affordable and exciting mobility</td>
</tr>
<tr>
<td>14:30</td>
<td>E-Drive Systems II</td>
<td>Brüssel</td>
<td>Adaptive roll stabilization - combination of roll rate and roll damping for better agility and comfort</td>
<td>T. Schrüllkamp, D. Schröder, A. Gersmeier - Mubea Fahrwerksfedern GmbH, S. Vos - BMW AG</td>
</tr>
<tr>
<td>15:00</td>
<td>Mobile &amp; Sustainability</td>
<td>K1 Aachen</td>
<td>Adaptive roll stabilization - combination of roll rate and roll damping for better agility and comfort</td>
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</tr>
</tbody>
</table>

### Technical Presentations Program

#### Overview

**Session Chair**

- Prof. Dr. Hermann Rottengruber
  - Uni Magdeburg

- Prof. Dr. Peter Urban
  - ika, RWTH Aachen University

#### Presentations

- **ERS: An essential tool to decarbonize heavy transport**
  - C. Thorén - Scania

- **Technology options to reduce cold start emissions – electrical catalyst heaters**
  - D. Rose, F. Kunath, B. Coulet, P. Nicolin, T. Boger, T. A. Collins, J. M. Grochocinski - Corning

- **Green is the new cool - intensifying electrification for sustainable, affordable and exciting mobility**
  - M. Alt, R. Matthe, C. de De Marino - Stellantis

- **Adaptive roll stabilization - combination of roll rate and roll damping for better agility and comfort**
  - T. Schrüllkamp, D. Schröder, A. Gersmeier - Mubea Fahrwerksfedern GmbH, S. Vos - BMW AG

#### Information

**Session Chair**

- Prof. Dr. Peter Urban
  - ika, RWTH Aachen University
We have always known that our industry would undergo a transition towards sustainable mobility. With this in mind, we made the decision more than two decades ago to focus on fuel cells. Ten years later, we established a business unit for battery technology and electromobility. Today, as a leading international technology group and automotive supplier, we provide next-generation solutions for all drivetrain concepts. In addition to drawing on our in-house expertise in lightweight construction for all kind of drive systems, we manufacture components for lithium-ion batteries. Through our joint venture EKPO Fuel Cell Technologies, we supply high-performance fuel cell stack modules as well as matching components – for truly sustainable mobility.

www.elringklinger.com
Closing Plenary Session in the Europa Hall

15:40 Hydrogen in transport applications
Gerrit Marx
Chief Executive Officer, IVECO GROUP

16:00 Electromobility from the Viewpoint of a Leading Battery Manufacturer
Kai-Uwe Wollenhaupt
President SVOLT Europe & Vice President, SVOLT Energy Technology

16:20 Plenary Discussion

16:40 Closing Address
Univ.-Prof. Dr.-Ing. Stefan Pischinger
Director, TME, RWTH Aachen University

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

16:45 End of Colloquium
MANAGING THE COMPLEXITY
OF ADAS/AD SYSTEMS

ADAS/AD features can’t be handled as isolated units. They will not only interact with all vehicle domains – such as steering, braking, powertrain or infotainment – but also with an intelligent infrastructure and digital maps.

Through our scenario based systems engineering approach, we support our customers to manage this complexity.

Digitalizing Mobility,
Connecting People.

Find out more at
www.fev.io
Overview

Presentations

Information

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</thead>
<tbody>
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**Speakers & Session Chairs**

**Overview Presentations**

**Information**
Driving Experience: Circus Minimus

Technical Exhibition

Traditional Banquet

General Information

Outlook 2023
Driving Experience: Circus Minimus

The way we travel has always been in a constant state of change. Driven by a continuous development process, the mobility solutions are designed to get us from A to B faster, further, more comfortably and, for some time now, more sustainably and in line with our needs. Especially in urban areas, the call for new possibilities and solutions that meet current and future requirements is becoming louder, especially for individual transportation.

The Circus Minimus of the Aachen Colloquium Sustainable Mobility offers you the opportunity to test such new vehicle concepts and innovative operating strategies, which for example rely on the amplification of muscle power through e-motors, actuators that revolutionize maneuvering through dense urban traffic, or simply small, compact e-scooters with which you can quickly and effortlessly cross the city center, directly in front of the Eurogress and thus gain an insight into the current state as well as future micromobility.

You will also have the opportunity to present your own concepts and discuss them with a broad audience of experts.
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.

Exhibitor List – Ground level

01 DENSO AUTOMOTIVE Deutschland GmbH
02 Dassault Systemens Deutschland GmbH
03 FAURECIA
03a Bosch
04 FEV Europe GmbH
05 iwis motorsysteme GmbH & Co. KG
06 UNICARagil
06a Grizzlar UG
07 Freudenberg Performance Materials SE & Co. KG
08 SEI Automotive Europe GmbH
09 Hitachi Astemo
10 Kautex Textron GmbH & Co. KG
11 S&P Global Mobility
12 Albonair GmbH
13 Hanon Systems Deutschland GmbH
14 HORIBA Europe GmbH
15 AVL list GmbH
16 JB CarConcept GmbH
17 IAV
18 EringKlinger AG
19 VEMAC GmbH & Co. KG
20 fka GmbH
21 ETO GRUPPE TECHNOLOGIES GmbH
22 Powertrain Engineering Sweden Aurobay
23 Albert Handtmann Metallgusswerk GmbH & Co. KG
24 BorgWarner Stuttgart GmbH
24a Simerics GmbH
25 HYUNDAI WIA CORPORATION
Exhibitior List – 1st Floor

26  Sonceboz SA
27  Springer Vieweg
28  Tula Technology Inc
29  dSpace GmbH
30  Gates industrial Europe
31  Miba Group
32  EOMYS ENGINEERING
33  RAPA Automotive GmbH & Co. KG
34  ACTech GmbH
35  Melec EWS GmbH
35a  AT & S Deutschland GmbH
36  Garrett Motion
37  KAMAX Automotive GmbH
38  IHI HAUZER TECHNO COATING B.V. and Ionbond
CREATING IDEAS & DRIVING INNOVATIONS

Hot topics 2022:
- Functional safety
- LiDAR Testing
- LevelXData
- Steer by Wire
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 11th, 2022
7.30pm Entrance
8.00pm Start
13th Aachen Acoustics Colloquium
Development and Research in Automotive Acoustics

November 21 – 23, 2022
Parkhotel Quellenhof Aachen, Germany

Topics
Acoustics of Electric Drives, Fuel Cell Systems 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)

Plenary Speakers:
Prof. Dr. Marc Schoenwiesner
Universities of Leipzig and Montreal

Dr.-Ing. Renzo Vitale
BMW Group

www.aachen-acoustics-colloquium.com
Next year the Aachen Colloquium will take place for the 32nd 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 2022: [www.aachener-kolloquium.de](http://www.aachener-kolloquium.de)

**Important Dates**

**Deadline for abstracts**
February 2023

**Notification of the authors from**
April 2023

**Deadline for submission of the manuscripts for the conference proceedings**
August 2023

**32nd Aachen Colloquium Sustainable Mobility**
October 9th – 11th, 2023

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**Main Topics for 2023**

**Full Vehicle & Mobility Concepts**

- Data-driven Development Processes: Processing, Use, Protection and Evaluation
- Chassis & Vehicle Dynamics
- Functional Safety
- Sustainability, Recycling, LCA & Balances
- New Vehicles, Architectures & Interior Concepts
- Strategies and Business Models of the Automotive Industry: Sustainable / Digital / Multimodal /...
- Zero-Impact Emission Concepts

**Drive Technologies**

- Alternative Fuel Application
- Battery Systems, Management & Safety
- Vehicle Electrical Systems & 48V Technologies
- Fuel Cells
- Electrification & Hybridization
- Energy & Thermal Management

**Digitalization and Automation**

- Automated Driving (Level 3+), Databases & AI
- Digital Development Process: Digital Twin, AI, Methods and Simulation
- Driver Assistance & Connected Driving (ADAS)
- Innovative E/E Vehicle Architectures
- Sensors & Perception of Environment in Vehicles and Infrastructure
- Software Development for the Automobile (incl. Cyber Security)
- Traffic Simulation and Scenarios
Registration
Since the beginning of May 2022

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 https://www.aachener-kolloquium.de/en/registration.html)
2) Receive confirmation by e-mail
3) Wait and settle the invoice
4) Registration completion after Receipt

Participation Fee
Participation Fee: 1185,- €*
Participation Online: 750,- €*

University Members 50 % Discount*

*All prices are exclusive of 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. 10th, 2022 04:00pm - 07:00pm
Tuesday, Oct. 11th, 2022 07:30am - 06:00pm
Wed., Oct. 12th, 2022 07:30am - 05:00pm

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