chassis.tech plus 2022

4 congresses in one event

5 – 6 July 2022
Munich, Germany
or virtually via live stream

Hybrid event
Your choice:
Participate on-site
or virtually via live stream

KEYNOTE LECTURES

ADAC e.V. / Continental Teves AG & Co. oHG / Ducati Motor Holding s.p.a. / IHS Markit / Porsche Engineering Services, s.r.o. / Robert Bosch GmbH
Welcome

In the triad comprising the driver, the vehicle, and the chassis, it is the latter that is the decisive factor when it comes to achieving the optimum values in terms of driving safety, sportiness, and comfort. In addition, trends such as automated driving and powertrain electrification will have further repercussions on chassis architectures. This Herculean task can only be mastered by interdisciplinary teams of engineers who see the chassis as a complete system and work on it accordingly. The process is supported by agile development methods and computer simulations as well as driving simulators and real road tests for both current and future systems.

The 13th International Munich Chassis Symposium chassis.tech plus once again aims to bring together up to 500 specialists for an exchange of ideas and experience. Experts in suspension systems, steering, brakes and tires/wheels, as well as ADAS will find the very latest information and will have the opportunity to discuss current developments in detail.

You can look forward to keynote lectures by Dr. Hans-Jörg Feigel (Continental), Helge Westerfeld (Bosch), Patricio Barbale (IHS Markit), and Andreas Rigling (ADAC) on the first day of the symposium, as well as short interviews with leading experts. On the second day, Thomas Sprengel (Porsche Engineering) and Leonardo Bagnoli (Ducati) will present their valuable assessments.

We look forward to welcoming you to the Bayerischer Hof in the center of Munich or virtually via our live stream and hope you have an exciting and informative conference.

Prof. Dr. Peter E. Pfeffer
Hochschule München University of Applied Sciences
Scientific Director of the Symposium

Stay at the cutting edge!

- Highly relevant technical papers presented by renowned speakers
- Networking in the international expert community
- Innovative products and services

ONE FOR ALL
4 congresses in one event

/ chassis.tech plus
Optimization of the chassis for the challenges of automated driving, vehicle dynamics, and comfort
Calibration of chassis functions using virtual methods, testing solutions, and road tests

/ chassis.tech
Redundant chassis systems, the driver, and the vehicle in the focus of development concepts and security

/ steering.tech
New steering systems for steer-by-wire and digital twins

/ brake.tech
Modern brake systems in harmony with environmental aspects and excellent driving characteristics

/ tire.wheel.tech
Efficient tire/wheel systems for reduced tire wear and greater range

13TH INTERNATIONAL MUNICH CHASSIS SYMPOSIUM

The choice is yours: attend on-site or virtually via live streams of all sessions.
One for all – 4 congresses in one event

The International Munich Chassis Symposium with its accompanying trade exhibition is the key worldwide meeting place for the chassis community in the fields of the chassis, steering, brakes, and tires/wheels.

The 1st day will be taken up by the interdisciplinary section chassis.tech plus with two parallel sessions of lectures in the afternoon.

The symposium will focus on overriding issues relating to chassis systems and vehicle dynamics, before dividing up on the 2nd day into the following four parallel sections concentrating on the chassis, steering, brakes, and tires/wheels:

- chassis.tech
- steering.tech
- brake.tech
- tire.wheel.tech

In the afternoon, the parallel sections will merge together again for the interdisciplinary section chassis.tech plus.

In 2022, the symposium will focus on redundant chassis systems for automated driving, digital developments for steer-by-wire systems, and methods for measuring brake and tire wear. It will examine ways to ensure the long-term fulfillment of the increasing demands of customers, users, and legislation regarding agility and comfort as well as the requirements of sustainability and the environment, including more engineering efficiency and cost-effectiveness.

Accompanying exhibition

Throughout the entire conference, the accompanying exhibition will take place in the foyers on-site and virtually in the digital event platform. Manufacturers and suppliers from the automotive industry will present innovative products and services in the field of chassis technology to the specialist audience.

Participants

- Manufacturers of passenger cars and commercial vehicles and their suppliers
- Development service providers
- Universities and research institutes
- Manufacturers of measuring, testing, and simulation systems
- Authorities, associations, and testing institutes

Your Corona protection concept

In order to ensure that the ATZlive conference is safe and successful for all participants, even in times of Corona, we have drawn up a wide-ranging hygiene protection concept and are making detailed arrangements with the event partners.

If you would prefer to participate virtually in the event for health reasons or due to travel restrictions, we will offer you also this year parallel live streams.

chassis.tech plus 2022 as a hybrid event

The choice is yours: attend on-site or virtually via live streams

The streaming package includes the keynote lectures and all lectures of the two parallel strands on the 1st day as well as the four parallel sections on the 2nd day as live streams.

The digital event platform offers you

- Q&A feature in the live streams
- 1:1 video chats with attendees, exhibitors, and speakers
- live polls
- your personal program overview
- a virtual exhibition
- all available conference documents in one place for download
- as well as other useful functions

Evening reception in Munich Ratskeller

Tuesday, 05-07-2022 from 18:30 in Munich Ratskeller, Marienplatz 8, 80331 Munich

Experience a cozy evening in the traditional Ratskeller. We are happy to invite you to attend an evening of stimulating conversation with colleagues and to offer you the chance to enjoy Bavarian culinary delicacies.

The foundation stone of the Ratskeller was laid on 25 August 1867. However, the first landlord and landlady did not move into the premises of the new town hall until 1 August 1874, the date when the city council started its activities there.

In accordance with the Romantic spirit of the age, Georg von Hauberisser designed the edifice as well as the furnishings of the Ratskeller in the 16th-century Gothic style. Munich painters such as Heinrich Schlitt and Josef Rösl designed the various vaults.

The Ratskeller, established ever since then as a place of civic hospitality, extends a hearty welcome with its typical Bavarian charm.
In their keynote lectures, renowned speakers from the industry will provide forward-looking insights that go beyond the technical contents and illuminate the current issues from many different perspectives. In this way, the lectures, with their international focus, will be particularly important as a trend barometer for the conference.

### TUESDAY, 05-07-2022 / MORNING / FESTSAAL

#### KEYNOTE

**09:30**

**Dr. Hans-Jörg Feigel**
Senior Vice President, Strategy & Future Solutions, Continental Tires AG & Co. KG

**10:00**

**Holger Westerfeld**
Project Director, Vehicle Dynamics Control, Robert Bosch GmbH

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**Future chassis systems: evolution or revolution?**

- **11:15**
  - **Patricio Barbale**
  - **IHS Markit, Italy**

- **11:45**
  - **Stephanie Bertoldi**
  - **Michelin Reifenwerke AG & Co. KGaA**

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**11:45**

**Karlsruhe Institute of Technology (KIT)**

- **15:30**
  - **Michael Staude**
  - **Robert Bosch GmbH**

- **15:45**
  - **Edwin van der Stad**
  - **TNO**

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**16:00**

**Virtual assessment of motorcycle stability and comfort behavior and its influence on chassis design**

- **15:30**
  - **Thomas Sprengel**
  - **Continental Teves AG & Co. oHG**

- **16:00**
  - **Leonardo Bagossi**
  - **Continental Tyre Systems, Italy**

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**Latest rating updates for ADAS systems**

**11:45**

- **Tobias Linke**
  - **Knorr-Bremse SfN GmbH**

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**14:30**

**Integrated vehicle dynamics control – opening up new dimensions**

**11:15**

- **Andreas Higley**
  - **IHS Markit, Italy**

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**Impacts of megatrends on chassis systems**

**11:45**

- **Professor Patrick Gruber**
  - **University of Surrey, UK**

---

**15:30**

**Future impact on vehicle safety**

- **14:30**
  - **Christian Hartweg**
  - **Ober Automobil GmbH**

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<tr>
<td>08:00</td>
<td>Registration at the check-in</td>
</tr>
<tr>
<td>09:15</td>
<td>Welcome and opening</td>
</tr>
<tr>
<td>09:30</td>
<td>Future chassis systems: evolution or revolution?</td>
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<tr>
<td>10:00</td>
<td>Integrated vehicle dynamics control – opening up new dimensions</td>
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<tr>
<td>10:30</td>
<td>Opening of the accompanying trade exhibition and refreshment break in the exhibition area</td>
</tr>
<tr>
<td>11:15</td>
<td>Impacts of megatrends on chassis systems</td>
</tr>
<tr>
<td>11:45</td>
<td>Latest rating updates for ADAS systems</td>
</tr>
<tr>
<td>12:45</td>
<td>Lunch in the exhibition area</td>
</tr>
<tr>
<td>13:15</td>
<td>Keynote lectures I</td>
</tr>
<tr>
<td>14:15</td>
<td>Use of modern software development methods and functional safety testing</td>
</tr>
<tr>
<td>14:45</td>
<td>Theoretical and practical solutions in fail operational chassis electronics</td>
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<tr>
<td>15:15</td>
<td>Recent advances in level 2 and 3 ADAS systems and their impact on modern braking and steering systems</td>
</tr>
<tr>
<td>15:45</td>
<td>Refreshment break with coffee and tea in the exhibition area</td>
</tr>
<tr>
<td>16:30</td>
<td>Vision EQXX − innovative chassis system for a highly efficient electric vehicle</td>
</tr>
<tr>
<td>17:00</td>
<td>Development of steer-by-wire system requiring no changes in steering wheel hand position</td>
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<tr>
<td>17:30</td>
<td>Using DFSS and autonomy to aid in brake-to-steer vehicle performance characterization</td>
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<tr>
<td>18:30</td>
<td>Evening reception in Munich Ratskeller</td>
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**NEW SYSTEMS AND CONCEPTS**

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<tr>
<td>14:45</td>
<td>Mechanical-hydraulic, adaptive stabilizer bar with frequency-selective roll damping</td>
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<tr>
<td>14:45</td>
<td>Elasto-kinematic and structural design of the multi-link torsion axle and its full-vehicle evaluation</td>
</tr>
<tr>
<td>15:15</td>
<td>Sustainable and innovative lightweight solutions while staying cost-competitive</td>
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**SIMULATORS**

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<tr>
<td>16:30</td>
<td>Comfort evaluation on a dynamic driving simulator with advanced tire, road, and vehicle models</td>
</tr>
<tr>
<td>17:00</td>
<td>Subjective / objective assessment of a cable-driven simulator immersivity and realism</td>
</tr>
<tr>
<td>17:30</td>
<td>Gaining insight into cross-functional vehicle behavior − usage of a vehicle dynamics model in objective and subjective full-vehicle simulation (HL, SU &amp; DIM)</td>
</tr>
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**KEYNOTE LECTURES I**

- Andreas Rigling, Project Manager, Vehicle Safety, ADAC e.V.
  - Latest rating updates for ADAS systems
  - Impacts of megatrends on chassis systems

**KEYNOTE LECTURES II**

- Helge Westerfeld, Project Director Vehicle Dynamics Control, Robert Bosch GmbH
  - Integrated vehicle dynamics control – opening up new dimensions
  - Impacts of megatrends on chassis systems

**SHORT INTERVIEWS WITH EXPERTS OF THE INDUSTRY**

- Scott Sanford, Project Engineering Manager, CNOMotion, USA (in cooperation with Continental AG)
### Program Overview

#### AUTOMATED DRIVING – DEVELOPMENT METHODS
Moderation: Heinz Müller, Senior Vice President Engineering DriveTrain, Cabin & Chassis, Head of Planning & Concepts, MAN Truck & Bus SE

<table>
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<tr>
<td>08:30</td>
<td>KPI-based attribute development of lane keeping assist systems</td>
<td>Daniele Nied, Head of ADAS/AD Attributes, AUDI AG</td>
<td>[in cooperation with Myndanik AG, IFM, Kempten University of Applied Sciences]</td>
</tr>
<tr>
<td>09:00</td>
<td>A modular framework for the virtual calibration and validation of driver assistance systems</td>
<td>Moritz Marlochowy, PhD Student, Chassis Systems, Porsche Engineering Services GmbH [in cooperation with Chair of Mechatronics, University of Duisburg-Essen]</td>
<td></td>
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<tr>
<td>09:30</td>
<td>Tool and scenario development for LKA hardware-in-the-loop test</td>
<td>Federico Alattii, PhD Student, Simulation &amp; Control Engineer, Università Degli Studi di Firenze and Meccanica 42 Srl, Italy</td>
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#### AUTOMATED DRIVING – DRIVER AND SECURITY
Moderation: Dr. Christian Hartweg, Manager Vehicle Dynamic Specification & Requirements, Opel Automobile GmbH

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<td>10:30</td>
<td>Holistic driver perception – unaddressed challenges in autonomous driving today</td>
<td>Kevin Meuer, Manager Advanced Software Products, Continental Engineering Services GmbH</td>
<td></td>
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<tr>
<td>11:00</td>
<td>The key for future vehicles – development of chassis components according to cybersecurity regulations</td>
<td>Timo Lerche, Development Engineer, Chassis Development, IAV GmbH</td>
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<tr>
<td>11:30</td>
<td>Development of model predictive motion planning and control for autonomous vehicles</td>
<td>Jaume Carrillo Benavides, Project Engineer, Vehicle Dynamics, IDIADA Automotive Technology, S.A., Spain</td>
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#### AUTOMATED DRIVING – DEVELOPMENT TECHNIQUES
Moderation: Dr. Christoph Bittner, Director Development Chassis Systems, Dr. Ing. h.c. F. Porsche AG

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<tr>
<td>08:30</td>
<td>The Back Ring Light Element (BRLLE) – where user experience meets safety</td>
<td>Jonas Brott, Core Engineer, Joyway Safety Systems Aschaffenburg GmbH</td>
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<tr>
<td>09:00</td>
<td>Challenges and opportunities of integrating a stowable steering column with a steer-by-wire handheld actuator</td>
<td>Zachary Schultz, Steering Column Sr. Product Engineer, Keyser Patel, Engineering Software Supervisor, Nexteer Automotive Corp., USA</td>
<td></td>
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<tr>
<td>09:30</td>
<td>Decouplable steering system with the possibility of same-direction and opposite-direction wheel engagement</td>
<td>Fabian Weitz, Research Assistant, Institute of Vehicle System Technology (FAST), Karlsruhe Institute of Technology (KIT)</td>
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#### INNOVATIVE TECHNOLOGIES
Moderation: Prof. Dr. Ralph Mayer, Professorship Vehicle Systems Design, TU Chemnitz

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<tr>
<td>10:30</td>
<td>Basic safety guidelines for steer-by-wire for a new DIN standard</td>
<td>Dr. Matthias Schibel, Consultant for Pre-Development Steering Systems, BMW AG</td>
<td></td>
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<tr>
<td>11:00</td>
<td>Safety goals, item definition, and fault categories</td>
<td>Michael Schindel, Chief Engineer Steer-by-Wire Products, ZF Automotive Germany GmbH</td>
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</tr>
<tr>
<td>11:30</td>
<td>Controllability in the case of a first fault</td>
<td>Christian Klein, Development Engineer in the Pre-Development Steering Systems, BMW AG; Maximilian Wosche, PhD Student Development Steering Systems, Volkswagen AG</td>
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<td></td>
<td>Steer-by-wire – requirements and regulations</td>
<td>Joseph Boer, Officially Recognized Expert, TÜV SÜD Auto Service GmbH</td>
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#### ENVIRONMENTAL ASPECTS
Moderation: Ralf Schweizer, Head of Development Wheels, Tires, Tire Pressure Monitoring Systems, AUDI AG

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<td>10:00</td>
<td>Practical challenge: real-world driving drag torque of disc brakes</td>
<td>Philipp H Auracher, PhD Student, Brake Development, Dr. Ing. h.c. F. Porsche AG</td>
<td></td>
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<tr>
<td>11:00</td>
<td>Innovative brake fluid design for modern brake systems</td>
<td>Dr. Harald Dietl, Technical Marketing Manager, BASF SE [in cooperation with Robert Bosch GmbH]</td>
<td></td>
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<tr>
<td>11:30</td>
<td>Next evolutions in the development of brake emission testing</td>
<td>Christoph Danner, Project Manager Chassis, AVL List GmbH, Austria</td>
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### Lunch in the Exhibition Area

10:00 – 12:00, chassis.tech section – Palaishalle

10:30 – 12:00, steering.tech section – Festhalle

10:30 – 12:00, brake.tech section – Festhalle

10:30 – 12:00, tire.wheel.tech section – Königssaal

10:30 – 12:00, test.tech section – Loch zum Festsaal

### NEW BRAKE CONCEPTS AND TEST METHODS
Moderation: Prof. Dr. Rüdiger Tammann, Head of Chassis and Vehicle Dynamics, Automotive Engineering, RWTH Aachen

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<tr>
<td>08:30</td>
<td>Implications of brake system concepts without wheel individual rear-axle brakes</td>
<td>Tobias Loss, PhD Researcher Advanced Vehicle Systems, Robert Bosch GmbH [in cooperation with Institute of Electromobility, TU Kaiserslautern]</td>
<td></td>
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<tr>
<td>09:00</td>
<td>Embedding brake corners in a vehicle environment using hardware-in-the-loop</td>
<td>Marco Zolesioni, Technical Director, Link Europe GmbH [in cooperation with Link Engineering Company, USA]</td>
<td></td>
</tr>
<tr>
<td>09:30</td>
<td>Brake feel in professional driving simulators</td>
<td>Diego Miren, CTO, Vi grade s.r.l. [in cooperation with Dept. of Mechanical Engineering, Politecnico di Milano, Italy]</td>
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### TIES AND THE ENVIRONMENT
Moderation: Stefan Dittmar, Head of Wheels, TÜV SÜD Product Service GmbH

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<td>10:00</td>
<td>Innovation on wheels: how new mobility and the focus on sustainability will change wheel design</td>
<td>Ralf Doring, Vice President Global Engineering, Maxion Wheels (EAP Holding GmbH [in cooperation with Lochspe Maxion S.A., Brazil]</td>
<td></td>
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<td>11:00</td>
<td>Study on the relationship between wheel stiffness and driving stability</td>
<td>Atsushi Hirano, Assistant Chief Engineer Innovative Research Excellence Dynamics Performance, Honda R&amp;D Co., Ltd., Japan</td>
<td></td>
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<tr>
<td>11:30</td>
<td>Wheel concepts for extending the range of BEVs and upgrading the premium wheel design</td>
<td>Prof. Dr. Günter Leister, CEO, Tirewheel mobility solutions / terms consulting [in cooperation with Ulbrichts GmbH, Austria]</td>
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### Lunch in the Exhibition Area

12:00 – 14:00, lunch in the exhibition area
AFTERNOON

PROGRAM

WEDNESDAY, 06-07-2022

VEHICLE DYNAMICS
Moderation: Timo Schöning, Head of Department Chassis, Hyundai Motor Europe Technical Center GmbH

13:30 Study of improving comfortable turning feel by coordinated control between steering and suspension
Masayoshi Kimura, Senior Staff Engineer, Research and Development, Hitachi Astemo Langen GmbH
[In cooperation with Hitachi Astemo, Ltd., Japan]

14:00 Software as a product – road surface detection
Keyur Patel, Engineering Software Supervisor, Nexteer Automotive Corp., USA

14:30 Intelligent combination of software calibration and highly responsive hydraulics control
Alexandre Alonso Torres, Development Engineer Innovative Suspension Systems, KYB Europe GmbH, Spain; Christian Macrì, Product Planning and Strategy Manager, KYB Europe GmbH

DIGITAL DEVELOPMENT
Moderation: Dirk Ferge, Senior Manager Business Development & Innovation, JTEKT Europe

13:30 Application of digital twins in EPS/SbW development
Dr. Stefan Kirschstein, Engineering Manager System and Vehicle Simulation, ZF Automotive Germany GmbH

14:00 Enhancement of subjective steering feel in driver-in-the-loop simulators
Michael Nayler, Principal Engineer, Vehicle Dynamics and Multibody Systems, HORIBA MIRA Ltd., UK

14:30 Evaluation of steering feel with different feedback actuators in driving simulators
Florian Goy, Vehicle Dynamics Engineer, Hyundai Motor Europe Technical Center GmbH [in cooperation with MdynamiX AG; Kempten University of Applied Sciences]

FUTURE BRAKE SYSTEMS
Moderation: Dr. Falk Hecker, VP Technology – Driver Assistance and Automated Driving, Knorr-Bremse Systeme für Nutzfahrzeuge GmbH

13:30 Modular brake systems for future requirements
Alexander Gaedke, VP Program Management IPB, Robert Bosch GmbH

14:00 Redundant brake systems for true by-wire applications
Holger Schmidt, Senior Expert Redundant Brake Systems for Automated Driving, Continental Teves AG & Co. OHG

14:30 Virtual vehicle development approach for optimizing energy efficiency and vehicle stability of electrified vehicles using the example of brake blending
Dr. Steven Yan, Business Development Manager Powertrain, IPG Automotive GmbH

TIRES AND VIRTUAL DEVELOPMENT
Moderation: Edwin van der Stad, Vice President Europe, Nexen Tire Europe s.r.o.

13:30 Tire performance optimization using intercoupled TRICK, thermoRIDE, and weakRIDE physical models
Prof. Dr. Flavia Paretti, Assistant Professor @ UniNa and CEO & Co-Founder @ MagaRide, Department of Industrial Engineering, University of Naples Federico II (in cooperation with MagaRide SRL), Italy

14:00 RFID in tires is the new market standard to connect tires to their ecosystems
Christophe Dos, RFID Initiative Leader for Car Manufacturers, Manufacture Française des Pneumatiques Michelin, France

14:30 Efficient tire/handling development by applying virtual vehicle and tire layout
Carsten Schröder, Head of Expert Field Vehicle Dynamics, Continental Reifen Deutschland GmbH [in cooperation with Volkswagen AG]

15:00 Refreshment break with coffee and tea in the exhibition area

KEYNOTE LECTURES III
Moderation: Prof. Dr. Peter E. Pfeffer, Automotive Engineering, Hochschule München University of Applied Sciences

15:30 Chassis development in China – overview and trends
Thomas Sprengel, Senior Manager, Chassis Development, Porsche Engineering Services, s.r.o., Czech Republic

16:00 Virtual assessment of motorcycle stability and comfort behavior and its influence on chassis design
Leonardo Bagnoli, Head of Vehicle Simulation Dept., Ducati Motor Holding s.p.a., Italy

16:30 Closing remarks
Prof. Dr. Peter E. Pfeffer, Automotive Engineering, Hochschule München University of Applied Sciences; Dr. Alexander Heintzel, Editor-in-Chief ATZ | MTZ Group, Springer Nature

The current program is also available online:
www.atzlive.de/en/chassis
**EVENT INFORMATION**

**Registration fee**

**Participation on-site – limited**
€ 1,595.– plus VAT

The “participation on-site” package includes the keynote lectures and all presentations of the two parallel strands on the 1st day and the four parallel sections on the 2nd day. Also included are the event documents, the accompanying trade exhibition, the use of the digital event platform as well as catering during breaks, and the evening event on 05-07-2022.

**Participation virtually via live stream – unlimited**
€ 995.– plus VAT

The “participation via live stream” package includes the keynote lectures and all lectures of the two parallel strands on the 1st day as well as the four parallel sections on the 2nd day as live streams. Also included are the event documents and the use of the digital event platform with virtual trade exhibition.

University members of the IAVSD receive a 50 % discount on the registration fee.

**Languages used in the presentations**

On-site: German and English with simultaneous interpreting (German – English / English – German)

Virtually via live stream: English audio transmission

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**Further Information and Online Registration:**

www.atzlive.de/en/chassis

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**Date**
5 – 6 July 2022

**Venue**
Hotel Bayerischer Hof or virtually via live stream
Promenadenplatz 2 – 6, 80333 Munich, Germany

**Hotels**
Some hotels have room blocks at reduced prices for the participants. You can find more information on the events page of our website.

**Evening reception in Munich Ratskeller**
Tuesday, 05-07-2022 from 18:30 in Munich Ratskeller, Marienplatz 8, 80331 Munich, Germany

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SEMINAR LEADERS

Prof. Bernhard Schick
MdynamiX AG, University of Applied Sciences Kempten

Prof. Dr. Peter E. Pfeffer
MdynamiX AG, University of Applied Sciences Munich

More information on schedule, registration & GTC:

In collaboration with:

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