

# 11. Aachen Acoustics Colloquium

November 25 – 27, 2019

Pullman Aachen Quellenhof, Germany

Development and Research in

## AUTOMOTIVE ACOUSTICS

### PROGRAM BOOK



**AAC 2019** 

AACHEN ACOUSTICS COLLOQUIUM  
AACHENER AKUSTIK KOLLOQUIUM



Aachen is one of the most important centers for development and research in automotive acoustics. This year, the Aachen Acoustics Colloquium takes place for the eleventh time under the aegis of Prof. S. Pischinger, FEV Group, Prof. L. Eckstein, fka GmbH, Prof. K. Genuit, HEAD acoustics GmbH, and Prof. M. Vorländer, Institute of Technical Acoustics of RWTH Aachen University.

In the context of the Aachen Acoustics Colloquium, recent methods and technologies within the field of acoustics and vibrations of vehicles and drives are presented and discussed in detail in 23 dedicated papers and presentations. The continuous and free exchange of ideas between colleagues and experts, working in both industry and research, will ensure that consumers will keep finding attractive vehicles with an appealing sound.



## Organizers

FEV Group

fka GmbH

HEAD acoustics GmbH

Institute of Technical Acoustics of RWTH Aachen University





**Prof. Dr. Uwe Baake**

Head of Product Engineering Mercedes-Benz  
Trucks

Daimler AG



**Dr. Michael Fischer**

Chief Expert and Head Center of Competence  
NVH

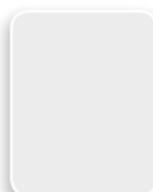
Robert Bosch GmbH



**Andreas Geelink**

Head of Acoustics,  
Properties / Special Vehicles

AUDI AG



**Dr. Christian Schuster**

Manager Vehicle NVH Programs Ford  
of Europe

Ford-Werke GmbH



**Dr. Per-Olof Sturesson**

Specialist for

Driving Dynamics & Noise & Vibration



**Prof. Dr. Otto von Estorff**

Head of the Institute of Modelling and  
Computation

Technical University of Hamburg-Harburg



## Driving Event AAC 2019

Like the years before, we offer participants of the Aachen Acoustics Colloquium the opportunity to experience different vehicles and prototypes on the test track acoustically.

On Monday, November 25th, 2019, the test track is open from 12.00 p.m. to 4.00 p.m.

Our free shuttle service in front of the Hotel Pullman Aachen Quellenhof will offer you a ride to the test track.

The registration for the Driving Event is retrieved within the registration process for the Colloquium.



Shuttle Service



Tent



Parking space



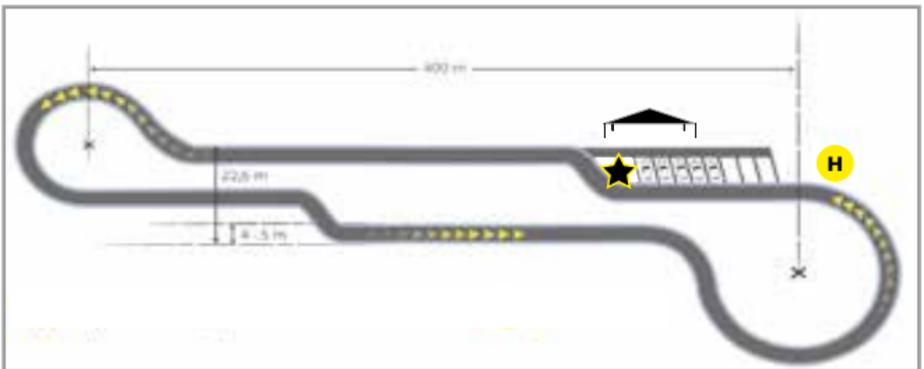


## Transfer to the Test Track

A shuttle service from the Quellenhof to the test track is offered at:

- 12.00 p.m.
- 2.00 p.m.

Departure from the test track back to Quellenhof is organized according to demand.





## **Welcome Reception and Opening of the Technical Exhibition**

19:00 The welcome reception will take place at the exhibition, Hotel Pullman Aachen Quellenhof, with drinks and food. The reception is free of charge.

### **Meeting Venue**

Hotel Pullman Aachen Quellenhof  
Monheimsallee 52  
52062 Aachen, Germany  
Phone: +49 241 91320  
Internet: [www.pullmanhotels.com](http://www.pullmanhotels.com)





## Welcome and Opening

08:30 Prof. Stefan Pischinger

FEV Group

Prof. Michael Vorländer

Institute of Technical Acoustics of  
RWTH Aachen University

## Alternative Drives

Session Chair: Prof. Stefan Pischinger  
FEV Group

08:45 The change in the automotive  
industry and the consequences for  
NVH

Josef Honeder

BMW AG



09:30 Development of an operating strategy for a  
parallel-series powertrain concept considering  
the acoustic

Andreas Viehmann

Jean-Eric Schleiffer

Stephan Rinderknecht

IMS, TU Darmstadt

10:00 Acoustics of electric powertrains:  
From multiphysics simulation to multi-criteria  
optimization

Dr. Pascal Bouvet

Dr. Jean-Baptiste Dupont

Henri Saucy

Vibratec

10:30 Break



## Vehicle Acoustics

Session Chair: Prof. Jan-Welm Biermann  
fka GmbH

- 11:00 Evaluation of axle gearbox noise using order-based operational transfer path analysis  
Dr. Alexander Kruse  
Dr. Thorsten Rumpel  
Daimler AG  
Lucas Coser  
Müller-BBM VibroAkustik Systeme GmbH
- 11:30 In-situ TPA for NVH analysis of powertrains: An evaluation on an experimental test setup  
Ahmed El Mahmoudi  
Prof. Daniel J. Rixen  
AM, TU München  
Dr. Keychun Park  
Hyundai Motor Company
- 12:00 Evaluation of objective metrics for the quantification of subjective experiences of road noise  
Ben Munday  
Gareth Thomas  
Tom Huntley  
Ricardo UK Ltd.
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12:45 Lunch

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## Active Systems

Session Chair: Dr. Aulis Telle

HEAD acoustics GmbH

13:45 Development of AVAS sounds at Audi

Dr. Stephan Gsell

Michael Werner

AUDI AG

14:15 Scalable system approach for exterior vehicle sound synthesis

Dr. Dirk Olszewski

Johannes Boehm

Klaus Rodemer

Philipp Rathmann

paragon GmbH & Co. KGaA

14:45 An efficient methodology for designing and delivering interior and exterior noise for an electric vehicle

Mark Allman-Ward

Graham Franks

Bruel & Kjaer

Piercarlo Miglietta

Gianluca DiNenno

FCA

15:15 Interior and exterior noise design using vehicle audio systems

Marius Lauen

Dr. Georg Eisele

Simon Lange

Dr. Christoph Steffens

FEV Europe GmbH

15:45 Break



## **Simulation**

Session Chair: Prof. Michael Vorländer  
Institute of Technical Acoustics of  
RWTH Aachen University

16:15 Full-frequency range vibro-acoustic analysis of  
automotive windows

Dr. François Van Herpe  
PSA Groupe

Dimitri Binet

Markus Brandsetter

Dr. Panagiotis D. Antoniadis  
Free Field Technologies

16:45 Numerical Design of Loudspeaker Systems

Prof. Otto von Estorff

Dr. Olgierd Zaleski

Dr. Sören Keuchel

Novicos GmbH

17:15 Influence of uncertainty of receiver position on  
interior car acoustic simulation

Philipp Schäfer

Prof. Michael Vorländer

ITA, RWTH Aachen University





## **Banquet**

19:00 Reception and welcome

19:30 The banquet will take place at the historical city hall of Aachen and is free of charge for attendees. The fee for accompanying persons is € 50.

## **Address**

Rathaus Aachen

Markt

52062 Aachen, Germany

Internet: [www.route-charlemagne.eu](http://www.route-charlemagne.eu)





## Alternative Drives II

Session Chair: Prof. Klaus Genuit  
HEAD acoustics GmbH

08:30 Adding comfort to mobility – mount solutions for electric motors

Enrico Kruse

Vibracoustic AG & Co. KG

Ludovic Chauvet

Vibracoustic Nantes SAS

09:00 Sound quality metric development for EV whine noise

Fabian Kamp

Philipp Sellerbeck

HEAD acoustics GmbH

09:30 Tyre/road noise and rolling resistance

Prof. Wolfgang Kropp

Chalmers University of Technology



10:15 Break

## Component NVH

Session Chair: Prof. Lutz Eckstein  
fka GmbH

10:45 Concept study: From the structural modal analysis to the sound radiation of a clutch and flywheel housing

Dr. Ramona Bomhardt

Martin Svensson

Volvo Group Trucks Technology



11:15 Development of total backlash measurement technique for A/T & correlation study of vehicle tip-in shock

Hyun Ku Lee

Moo Suk Kim

Sa Man Hong

Si Yoong Kim

Dong Kyu Yoo

Hyundai Motor Company

11:45 A modified In-situ sound power evaluation method of electric drivetrain units under realistic load conditions

Roman Sereinig

Christian Haigerer, PhD

Mario Hasenstein

Magna Powertrain Engineering Center Steyr

GmbH & CoKG

Shunichi Suzuki

Masaki Itabashi

Honda R&D Co.

## Get to the Aachen Acoustics Colloquium by train

In cooperation with Deutsch Bahn, Accor offers special conditions for getting to the Aachen Acoustics Colloquium by train.

2nd class 99 €

1st class 159 €



For more information, terms of conditions and bookings please contact Deutsch Bahn by phone at the phone service number +49 1805 - 31 11 53\* using the keyword „ACCOR MICE“.

\* 14ct/min from German landline, mobile may differ, available from monday to saturday, 8a.m to 9p.m



12:15 System level NVH analysis using a dedicated chassis test rig

Ruslan Latfullin

Gunnar Böttcher

Thomas Böttcher

Prof. Lutz Eckstein

ika, RWTH Aachen University

Björn Reff

Ford-Werke GmbH

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12:45 Lunch

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## **Simulation II**

Session Chair: Dr. Georg Eisele  
FEV Europe GmbH

14:00 NVH CAE development process of the new Ford Truck; F-Max

Baran Gumus

Ford Otosan

14:30 Auralizing the noise of electric vehicles using multibody simulation and experimental transfer path analysis

Dominik Stretz

Mark Nichols

Schaeffler Technologies AG & Co. KG



15:00 Advanced control algorithms to suppress high-frequency PWM current and force harmonics

Dr. Thomas Windisch

Dr. Jan Bräunig

Jan Troge

Prof. Welf-Guntram Drossel

Fraunhofer IWU

15:30 Conclusion and final remarks

Prof. Lutz Eckstein

fka GmbH

Prof. Klaus Genuit

HEAD acoustics GmbH

15:40 End of colloquium





## Registration

Please register for the Aachen Acoustics Colloquium at:  
[www.aachen-acoustics-colloquium.com](http://www.aachen-acoustics-colloquium.com)

Please scan the QR code for further information or registration.



## Payment

The registration fee of € 795 (plus 19 % VAT) also includes a welcome reception at the Hotel Pullman Aachen Quellenhof as well as a banquet and the proceedings. Your registration will be confirmed by the invoice, which will be sent to you. Registration is completed after receipt of payment.

Please note that in case of cancellation prior to 15.10.2019, the participant's fee will be reimbursed (less € 75 exclusive of 19 % VAT for administrative costs). After that, the participant's fee cannot be reimbursed.

## Hotel Reservation

Please book your hotel room via aachen tourist service by using the following link:

[www.aachen-acoustics-colloquium.com/accommodation.htm](http://www.aachen-acoustics-colloquium.com/accommodation.htm)

Please scan the QR code for further information or hotel reservation.



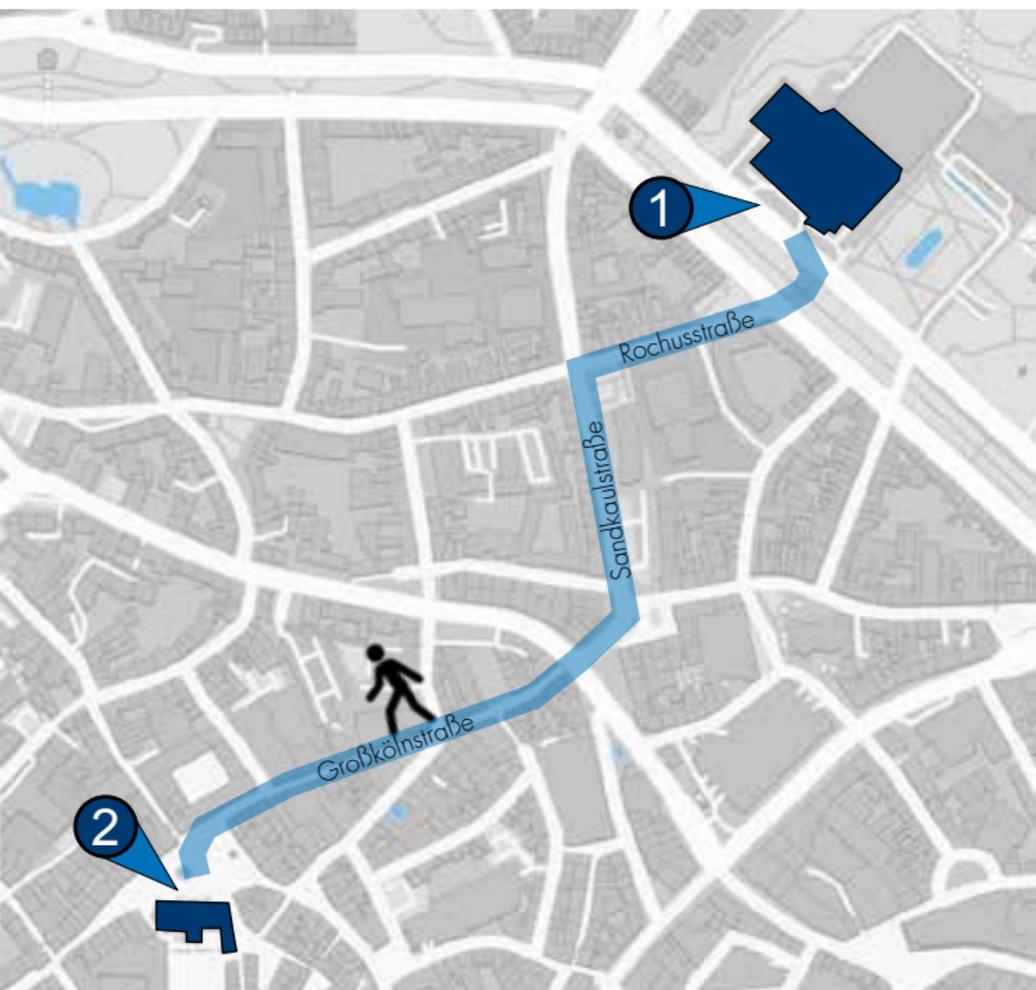


## Locations of Interest



**1** Hotel Pullman  
Aachen Quellenhof  
Monheimsallee 52  
52062 Aachen

**2** Rathaus Aachen  
Markt  
52062 Aachen





## Parking Information

This year again, participants of the Aachen Acoustics Colloquium can park free of charge in the **APAG** car parks (exception: car park Carolus Thermen No. 13). The Quellenhof car park is not an APAG car park!

You will receive a **3-day parking ticket** at our information desk on request. The congress park ticket enables unlimited access to the car parks during the period of 25. - 27.11.2019





## Contact

### Aachen Acoustics Colloquium GbR

E-Mail: [info@aachen-acoustics-colloquium.com](mailto:info@aachen-acoustics-colloquium.com)

Internet: [www.aachen-acoustics-colloquium.com](http://www.aachen-acoustics-colloquium.com)

[www.aachener-akustik-kolloquium.de](http://www.aachener-akustik-kolloquium.de)

### Attendees

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### Exhibitors

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[www.aachen-acoustics-colloquium.com](http://www.aachen-acoustics-colloquium.com)  
[www.aachener-akustik-kolloquium.de](http://www.aachener-akustik-kolloquium.de)

