
AAC 2023

AACHEN ACOUSTICS COLLOQUIUM

November 27th - 29th, 2023



PROGRAM

**DEVELOPMENT AND RESEARCH
IN AUTOMOTIVE ACOUSTICS**

www.aachen-acoustics-colloquium.com

FOREWORD

14TH AACHEN ACOUSTICS COLLOQUIUM



Parkhotel Quellenhof Aachen, Germany

Are you looking for new ideas and methods to improve the acoustics and vibrations of vehicles and drives? The Aachen Acoustics Colloquium is the perfect opportunity for experts from both industry and research to exchange knowledge and ideas within the field of acoustics and vibrations of vehicles. With 20 technical presentations and 2 plenary speeches, you can stay up-to-date in this ever-evolving field. Attend the Aachen Acoustics Colloquium to get the competitive edge that you need and to get familiar with the latest innovations and insights around acoustics and vibrations of vehicles and drives.

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 14th 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 for Hearing Technology and Acoustics of RWTH Aachen University.

Organizers

FEV Group, fka GmbH, HEAD acoustics GmbH, Institute for Hearing Technology and Acoustics of RWTH Aachen University



ORGANIZATIONAL AND LOCATIONS OF INTEREST

REGISTRATION

Please register for the Aachen Acoustics Colloquium at:
www.aachen-acoustics-colloquium.com

HOTEL RESERVATION

Please book your hotel room via aachen tourist service by using the following link:
www.aachen-acoustics-colloquium.com/accommodation

LOCATIONS OF INTEREST

1 Parkhotel Quellenhof
Monheimsallee 52
52062 Aachen

2 Rathaus Aachen
Markt
52062 Aachen

PAYMENT

The registration fee of € 940 (plus 19 % VAT) also includes a welcome reception as well as a banquet dinner.

Registration fee for university staff is € 470 (plus 19 % VAT).

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!**

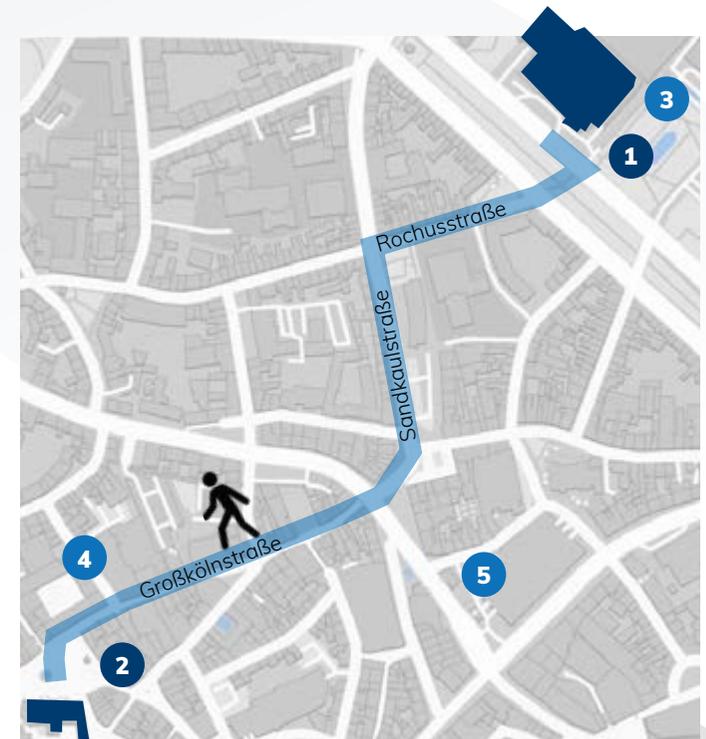
You will receive a 3-day parking ticket at our information desk on request. The congress park ticket enables unlimited access to the car parks during the period of 27. - 29.11.2023.

CAR PARKS

3 Parkhaus Eurogress
Monheimsallee 40
52062 Aachen

4 APAG Parkhaus Rathaus
Mostardstraße 5
52062 Aachen

5 APAG Parkhaus Couvenstraße
Couvenstraße 6
52062 Aachen



PLENARY SPEAKER

14TH AACHEN ACOUSTICS COLLOQUIUM



Tobias Hillers
Dr. Ing. h.c. F. Porsche AG

Driven by Dreams: Crafting the Porsche Electric Sport Sound, Honoring 75 Years of Sound Heritage

Porsche celebrates its 75th anniversary, reflecting on the challenge of developing a unique sound for fully electric vehicles. Exploring the rich heritage of Porsche's iconic sounds, we examine their historical significance and emotional connection. Amidst this backdrop, we unveil the task of crafting a distinctive sound for electric Porsches, navigating complexities and challenges. Blending tradition and innovation, the sound design process meticulously evokes emotions and defines the vehicle's character. Let us celebrate 75 years of historical sound heritage, experiencing the passion and technical brilliance that brings this dream to life and gaining insights into the future of automotive sound.



Prof. Jesko Verhey
Otto-von-Guericke
University Magdeburg

Vehicle Interior Noise in the Light of Auditory Sensations

The quality of the cabin noise is an important criterion when buying a vehicle. But which perceptual aspects determine this perceived sound quality? These perceptual aspects can be quantified by asking for auditory sensations. For example, the cabin noise of vehicles of electric drives is usually perceived less loud than that of a vehicle with an internal combustion engine, resulting in a higher perception of comfort. On the other hand, electric drives may produce a higher perceived magnitude of tonal content, which can reduce the pleasantness. If tonal components have very low-frequencies, they elicit yet other sensations. This talk will focus on several sensations and their possible role in perceived sound quality of vehicle interior noise and how this may be affected by the hearing abilities of the potential buyers.

SCIENTIFIC COMMITTEE

14TH AACHEN ACOUSTICS COLLOQUIUM



Prof. Uwe Baake
Vice President Product
Engineering
Mercedes-Benz Trucks
Daimler AG



Dr. Christian Schuster
Manager Vehicle NVH
Ford-Werke GmbH



Prof. Otto von Estorff
Head of the Institute of
Modelling and Computation
Technische Universität
Hamburg



Dr. Michael Fischer
Chief Expert and Head
Center of Competence NVH
Robert Bosch GmbH



Dr. Per-Olof Sturesson
Consultant, Cum Scientia
Engineering, Sweden
Researcher
KTH Royal Institute of
Technology, Sweden



Thomas Weidlich
Head of Acoustics / Structural
durability and fatigue
AUDI AG

PROGRAM

27TH & 28TH NOVEMBER

November 27TH

19:00 Welcome Reception for Colloquium Attendees

The welcome reception will take place at the exhibition, Parkhotel Quellenhof Aachen, with drinks and food. The reception is free of charge for our participants.

MEETING VENUE

Parkhotel Quellenhof Aachen
Monheimsallee 52
52062 Aachen, Germany
Phone: +49 241 91320
E-Mail: info@parkhotel-quellenhof.de
Internet: www.parkhotel-quellenhof.de

EXHIBITORS

Take a look at this year's exhibitors:
www.aachen-acoustics-colloquium.com/exhibition

November 28TH

08:30 Welcome and Opening

Prof. Klaus Genuit/
Prof. Michael Vorländer

ACTIVE SOUND DESIGN AND ACTIVE COMPONENTS I

Session Chair:
Prof. Michael Vorländer
Institute for Hearing Technology and Acoustics (IHTA),
RWTH Aachen University

08:45 Driven by Dreams: Crafting the Porsche Electric Sport Sound, Honoring 75 Years of Sound Heritage

Tobias Hillers
Dr. Ing. h.c. F. Porsche AG

09:30 Validation of Active Sound Design Models using Driving Simulator and Test Drive Evaluation

Stefan Hank
HEAD acoustics GmbH

10:00 QuietComfort Road Noise Control:

Helping Carmakers Design Better Cars

Michael Wirtz
Bose Automotive GmbH

10:30 Coffee Break & Snacks

VEHICLE AND DRIVE TRAIN ACOUSTICS

Session Chair:
Prof. Jan-Welm Biermann
fka GmbH

11:00 Structure-borne Road Noise Target Allocation to Tire-Wheel Subsystem in Autonomous Vehicles

Daniel Baker
Zoox, Inc.

11:30 The Sound of Silence – New challenges for BEV development

Christoph Steffens
FEV Europe GmbH

12:00 Influence of the Manufacturing Scatter on the Excitation Behavior in Series Production of an E-Motive Cylindrical Gear Stage

Laurenz Roth
Laboratory of Machine Tools and Production Engineering (WZL),
RWTH Aachen University

12:30 Lunch



PROGRAM

28TH NOVEMBER

NUMERICAL METHODS AND MEASUREMENT TECHNOLOGY

Session Chair:
Dr. Matthias Wegerhoff
HEAD acoustics GmbH

13:45 Numerical Frontloading of an Acoustical End of Line Test Station for a Rearview Camera System
Dr. Sören Keuchel
Novicos GmbH

14:15 An Industrial Validation of Automated Modal Analysis using Machine Learning
Markus Brandstetter
Siemens Digital Industries Software

14:45 Coffee Break

ACOUSTICS OF ELECTRIC DRIVES

Session Chair:
Dr. Christoph Steffens
FEV Europe GmbH

15:15 NVH improvement of e-motors through optimization of the control settings
Tongfang Fu
Chair of Thermodynamics of Mobile Energy Conversion Systems,
RWTH Aachen University

15:45 Investigation of the motor-freewheel's impact on the structural dynamics of an e-bike drive unit using flexible multi-body simulation
Kevin Steinbach
Bosch eBike Systems

16:15 Coffee Break & Snacks

ACOUSTIC MATERIALS

Session Chair:
Dr. Gottfried Behler
Institute for Hearing Technology and Acoustics (IHTA),
RWTH Aachen University

16:45 Acoustic Metamaterial: Space Saved Broadband Sound Absorption System by using Coupled Quarter-Wavelength and Membrane Resonator
Shunji Suzuki
Honda R&D Co., Ltd.

17:15 Application Concepts and Potentials of Vibroacoustic Metamaterials for NVH Comfort
Armin Weber
Institute for Automotive Engineering (ika),
RWTH Aachen University

17:45 FE-Based Inverse Approach to Determine Complex Acoustic Material Parameters in Alpha Cabins
Mark Müller-Giebeler
Institute for Hearing Technology and Acoustics (IHTA),
RWTH Aachen University

19:30 Champagne Reception

20:00 Opening by Prof. Stefan Pischinger
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.



PROGRAM

29TH NOVEMBER

SOUND QUALITY, TROUBLE-SHOOTING, SOUND DESIGN

Session Chair:
Prof. Klaus Genuit
HEAD acoustics GmbH

08:30 Influence of Tonality on the Annoyance of Tire Exterior Noise

Etienne Parizet
Laboratoire Vibrations Acoustique, INSA-Lyon

09:00 Large Scale End-User Jury Test on Artificial Enriched Interior Driving Sounds of Electric Vehicles

Rob Opdam
Bosch Engineering GmbH

09:30 Vehicle Interior Noise in the Light of Auditory Sensations

Prof. Jesko L. Verhey
University Magdeburg

10:15 Coffee Break & Snacks

EXTERIOR SOUND - THE BaLSaM PROJECT

Session Chair:
Prof. Lutz Eckstein
fka GmbH



10:45 Holistic Approach for Aurally Accurate Road Traffic Noise Reduction by Adaption of Traffic Routes and Infrastructure Planning

Carolin Schliephake
Institute for Automotive Engineering (ika),
RWTH Aachen University
Chalotorn Möhlmann
Institute for Hearing Technology and Acoustics (IHTA),
RWTH Aachen University

11:15 Urban noise protection measures from the perspective of urban designers– case study of the “Gräselberg - Auf den Eichen” master plan

Moritz Lippold
REICHER HAASE
ASSOZIIERTE GmbH

11:45 Optimizing the Estimation of Vehicle Sound Radiation Characteristics by Combining Numerical Models and Microphone Array Measurements

Thiago Henrique
Gomes Lobato
HEAD acoustics GmbH

12:15 Lunch

PROGRAM

29TH NOVEMBER

ACTIVE SOUND DESIGN AND ACTIVE COMPONENTS II

Session Chair:
Prof. Stefan Pischinger
FEV Europe GmbH

13:45 A Software Defined Audio Architecture for Acoustic Function Consolidation: Approach, Implementation and Benefits

Somasundaram Alagappan
BlackBerry QNX

14:15 Real-time Interaction with Driving Parameters: An AI-based Approach to Sound Design for Electric and Hybrid Vehicles

Dr. Rodrigo Schramm
Impulse Audio Lab

14:45 Low-Latency MIMO Loudspeaker-Room Compensation for Real-Time Driving Sound Enhancement in Electric Vehicles

Marius Lambacher
Müller-BBM Active Sound
Technology GmbH

15:15 Advancing Active Sound Design Systems for AVAS and Emotionalization: A Holistic Approach to Enhance Active Sound Design Systems

Lukas Lübbert
University of Applied
Sciences and Arts
Dortmund

15:45 Final Remarks

Prof. Lutz Eckstein/
Prof. Stefan Pischinger



CONTACT

Aachen Acoustics Colloquium GbR

E-Mail: info@aachen-acoustics-colloquium.com

Internet: www.aachen-acoustics-colloquium.com

General questions / Attendees

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Exhibitors

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