AAC 2024

AACHEN ACOUSTICS COLLOQUIUM

PROGRAM

Development and Research in Automotive Acoustics

November 25 – 27, 2024

Aachen, Germany

FEV fka HEAD acoustics IHTA RWTH AACHEN UNIVERSITY

www.aachen-acoustics-colloquium.com

FOREWORD
15TH 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 18 technical presentations, two plenary speeches and a new poster session, 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 15th time under the aegis of Prof. S. Pischinger, FEV Group GmbH, 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.

MEETING VENUE

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

Organizers

FEV Europe GmbH, 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

Register now!

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 € 980 (plus 19 % VAT) also includes a welcome reception as well as a banquet dinner.

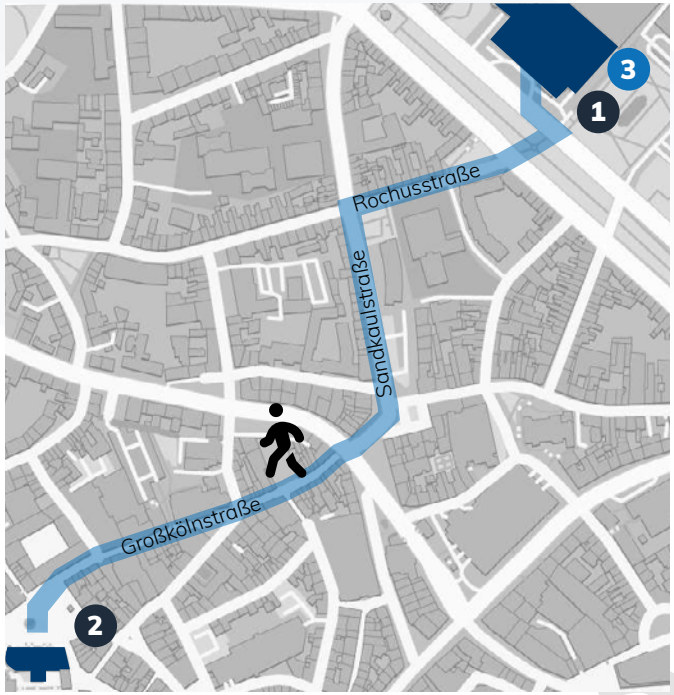
Registration fee for university staff is € 490 (plus 19 % VAT).

PARKING INFORMATION
This year again, participants of the Aachen Acoustics Colloquium can park free of charge in the APAG car park at Eurogress. **The Quellenhof car park is not an APAG car park!**

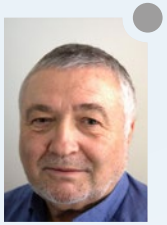
You will receive a 3-day parking ticket at our information desk on request. The congress park ticket enables unlimited access to the Eurogress car park during the period of 25. – 27.11.2024.

CAR PARKS

3 Parkhaus Eurogress
Monheimsallee 40
52062 Aachen



PLENARY SPEAKER
15TH AACHEN ACOUSTICS COLLOQUIUM



Hermann Ney
Human Language Technology and Pattern Recognition, RWTH Aachen University

Speech & Language Technology: Where Do We Stand?

The success of data-driven methods for speech recognition started more than 50 years ago. While these methods were originally designed only for speech recognition, i.e. the conversion of the speech signal to written text, they turned out to be most successful also for a wide variety of other tasks in language processing tasks like machine translation and natural language understanding. This talk will review the development of data-driven approaches to speech & language technology.

Dr. Stefan Heuer
MAN Truck & Bus

Heavy Commercial Vehicle NVH Development

Meeting customer expectations in terms of interior and exterior sound quality is one main target while developing heavy commercial vehicles. Based on NVH simulation as well as testing activities this is being realized today. One of the challenges in the commercial vehicle sector is product variance. The driver of a long haul truck lives and works in his vehicle all year round and expects a high level of comfort, another driver uses his truck mainly in the gravel pit and expects robustness above all. The task is to bring together all these demands for the different use cases and by this to contribute simplifying our customer's business to maximum possible. Conventional diesel as well as carbon dioxide free drive concepts will be discussed here. Some examples of component development will be presented. This article gives an inside into the NVH development of heavy commercial vehicles at MAN.

SCIENTIFIC COMMITEE
15TH AACHEN ACOUSTICS COLLOQUIUM

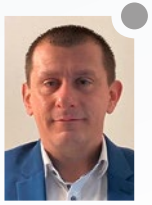
Prof. Uwe Baake
fmr. Head of Mercedes-Benz Trucks Product Engineering
Daimler Truck AG

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

Dr. Christian Schuster
Manager Vehicle NVH
Ford-Werke GmbH

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

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



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

PROGRAM
25TH & 26TH NOVEMBER

Register now!

November 25TH

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.

November 26TH

08:30 **Welcome and Opening**

Prof. Klaus Genuit
Prof. Michael Vorländer

INFOTAINMENT IN THE VEHICLE

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

08:45 **Speech & Language Technology: Where Do We Stand?**

Hermann Ney
Human Language Technology and Pattern Recognition, RWTH Aachen University

09:30 **Hybrid Speech Enhancement Solutions for Multi-Zone Voice Assistants in Vehicles**

Dr. Tim Haulick
Cerence GmbH

10:00 **Personalized sound playback adjustment for automotive audio**

Dr. Jan Rennies
Fraunhofer IDMT | Hearing, Speech and Audio Technology

10:30 **Coffee Break & Snacks**

Numerical Methods, Simulation, Virtual Reality

Session Chair:
Prof. Lutz Eckstein
Institute for Automotive Engineering (ika), RWTH Aachen University

11:00 **Tire identification for airborne SEA Simulation**

Dr. Jan Kralicek
Dr. Ing. h.c. F. Porsche AG

11:30 **Speed-dependent directivity patterns of road traffic sound sources**

Christian Dreier
Institute for Hearing Technology and Acoustics, RWTH Aachen University

PROGRAM
26TH NOVEMBER

Register now!

November 26TH

12:00 **Simulation of AVAS for Prototypes using FE and PML**
Nils Schönfeld
Technical University of Munich (TUM)

12:30 **Lunch**

POSTER SESSION

Session Char:
Prof. Roland Sottek
HEAD acoustics GmbH
Dr. Lukas Aspöck
Institute for Hearing Technology and Acoustics (IHTA), RWTH Aachen University

13:45 **Poster Pitch**
Short pitches of 2 – 3 minutes each, followed by discussions in the poster exhibition area

14:15 **Poster Session**

15:15 **Coffee Break**

NVH MEASUREMENT, SYSTEM-ANALYSIS, MEASUREMENT TECHNOLOGY

Session Chair:
Dr. Matthias Wegerhoff
HEAD acoustics GmbH

15:45 **Applied NVH-Characterization of Automotive Steer-By-Wire Systems - Methods and Results**
Mark Nichols
Schaeffler Technologies AG & Co. KG

16:15 **Investigation of Noise-Intensive Driving Patterns under Real Driving Conditions**
Carina Diemel
Institute for Automotive Engineering (ika), RWTH Aachen University

16:45 **Coffee Break & Snacks**

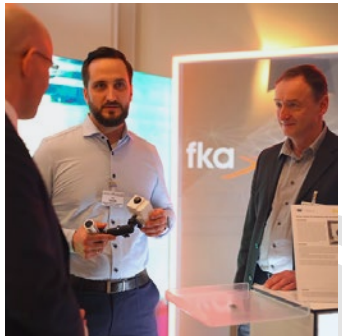
17:15 **Topology Optimization for Active Noise Control Systems Combining Multiple Sensor Layouts**
Prof. Alessandro Fortino
University of Applied Science Dortmund

17:45 **Study on the install location of acoustic metamaterials absorbing tire noise**
Shunji Suzuki
Honda R&D Co., Ltd.

19:00 **Champagne Reception**

19:30 **Banquet**
Prof. Lutz Eckstein
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
27TH NOVEMBER

Register now!

November 27TH

ACOUSTICS OF ELECTRIC DRIVES, FUEL CELL SYSTEMS AND HYBRID CARS

Session Chair:
Prof. Klaus Genuit
HEAD acoustics GmbH

09:00 **Evaluation of the NVH behavior of an Axial Flux Machine in 2D FE simulations**
Karsten Müller
Mercedes-Benz Group AG

09:30 **Psychoacoustic analysis of a PMSM under different working conditions in the drive system**
Carles Martrat
Nissan Technical Center Europe

10:00 **Coffee Break & Snacks**

VEHICLE ACOUSTICS (BODY, MECHATRONICS COMPONENTS,TIRE ROAD NOISE)

Session Chair:
Dr. Christoph Steffens
FEV Europe GmbH

10:30 **Heavy Commercial Vehicle NVH Development**
Dr. Stefan Heuer
MAN Truck & Bus

11:15 **Study on characteristic sound emissions of city busses with different powertrain types**
Dr. Michael Fischer
Robert Bosch GmbH

11:45 **Quiet Charging in the Mega Watt Range for Electric Trucks: Noise Source Identification and Targeting for Cooling Systems**
Dr. Michael Häußler
FEV Vehicle GmbH

12:15 **Lunch**

PROGRAM
27TH NOVEMBER

Register now!

November 27TH

ACTIVE SOUND DESIGN AND ACTIVE COMPONENTS

Session Chair:
Prof. Stefan Pischinger
FEV Europe GmbH

13:30 **Seamless Mode Shifts in next generation REX Hybrid Powertrains: Enhancing the Driving Experience with Augmented Sound**
Erik Nyström
Aurobay

14:00 **Personalized Active Sound Design**
Dr. Markus Bodden
neosonic GmbH

14:30 **Multidimensional Optimization for Performance, Environmental Adaptation, Robustness, and Wide-Space Noise Reduction: Key Feature Analysis of Active Road Noise Cancellation (RNC) Engineering for Mass Production**
Dr. Xiangjie Kong
Automotive Acoustics R&D Center, Alpha Labs, Goertek Inc.

15:00 **Coffee Break & Snacks**

15:15 **Tuning of Active Sound Design in Electric Vehicles with Focus on In-Car Communication**
Fabian Kamp
HEAD acoustics GmbH

15:45 **Road-induced Tire-cavity Noise Control (RTNC) for Increased Driving Comfort and Cost Efficiency**
Calvin Hartmann
Müller-BBM Active Sound Technology GmbH

16:15 **Final Remarks**
Prof. Klaus Genuit
HEAD acoustics GmbH
Prof. Stefan Pischinger
FEV Europe GmbH

POSTER SESSION
15TH AACHEN ACOUSTICS COLLOQUIUM

For the first time, AAC 2024 will also include the presentation of scientific posters. These posters will be displayed in the poster exhibitation area at the back of the presentation hall during the conference. On Tuesday from 1.45 pm to 3.15 pm, a time slot is dedicated to the poster. This session will start with short pitches of 2 – 3 minutes each, followed by open presentations and discussions in the poster exhibition area

The influence of power train bearing waviness on E-vehicle noise performance.
Piet van Dalen
SKF

On the use of audio objects for in-car sound systems
Christoph Sladeczek
Fraunhofer IDMT; transfer function GmbH

Energy based Finite Element Method applied to Automotive Structures with Metamaterials
Sören Keuchel
Novicos GmbH

Simulative Evaluation of eMotor Acoustic Performance Across Varied Load Spectra and Correlation Study to Measurements
Anton Plank
Magna Powertrain Engineering Center Steyr GmbH & Co KG

Acoustic emergency vehicle detection and lane assignment in the context of autonomous driving on highways
Danilo Hollosi
Fraunhofer IDMT-HSA

On the use of Virtual SEA for design optimization: a test case
Francesco Trainotti
Technical University of Munich, Chair of Applied Mechanics

Create, Tune and Integrate – EV Sound in the field of Professional Audio
Michael Wirtz
Bose Automotive GmbH

EXHIBITION
15TH AACHEN ACOUSTICS COLLOQUIUM

Register now and become an exhibitor of Aachen Acoustics Colloquium, including:

- ✓ A fully equipped booth (2.5 x 2.0 m)
- ✓ Entrance to the presentation and exhibition
- ✓ Entrance to the opening and welcome
- ✓ Entrance to the banquet
- ✓ Digital Proceedings
- ✓ Beverages + Lunches
- ✓ Publication of a company profile

Our exhibition company offers a complete booth with professional equipment. The exhibition fee includes the ticket for one person. If you need more booth support, please book additional tickets for a fee via our registration form.

Become an exhibitor!

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

CONTACT

Aachen Acoustics Colloquium GbR
info@aachen-acoustics-colloquium.com
www.aachen-acoustics-colloquium.com

General questions / Attendees
Jenny Palmen and Rebecca Trapp
HEAD acoustics GmbH
+49 24107 577-0
orga@aachen-acoustics-colloquium.com

Exhibitors
Dr. Marco Günther
tme, RWTH Aachen University
+49 241 80-48080
guenther@aachen-acoustics-colloquium.com

Authors
Dr. Lukas Aspöck
IHTA, RWTH Aachen University
+49 241 80-97987
lukas.aspoeck@akustik.rwth-aachen.de