

LECTURE INVITATION



Sound Quality of Audio Systems

Modeling, Measurement & Control

March 13th - 15th 2017 (Technical University Dresden, Germany)

The 2017 lecture on "Sound Quality of Audio Systems" presented by Prof. Dr. Wolfgang Klippel, honorary professor of the Institute of Acoustics and Speech Communication, will give you a deep understanding on the latest measurement and diagnostic techniques used in telecommunication, automotive, multi-media and professional applications to design small, light and cost-effective loudspeakers.

The generation of signal distortion is modelled by linear, nonlinear and time-variant systems with lumped and distributed parameters. The course makes the relationship between symptoms and physical causes of the distortion more transparent. Practical sections will give each participant further opportunities for learning by doing.

Highly recommended for:

- Students and teachers of the electro-acoustics
- Engineers of the Audio Industry active in Research & Development, Manufacturing, Quality Control

Key Topics

Benefit from the over 30 years of fundamental research by Prof. Dr. Klippel and apply this gained knowledge to your own field of work to improve the way you design and/ or manufacture your loudspeaker.

- COMPREHENSIVE ASSESSMENT OF AUDIO SYSTEMS
- PHYSICAL MEASUREMENT AND PERCEPTIONAL EVALUATION
- ROOT CAUSE ANALYSIS OF SIGNAL DISTORTION
- DESIGNING GREEN SPEAKERS - PROVIDING MORE OUTPUT WITH HIGHER EFFICIENCY AND LOWER COST
- ACTIVE CONTROL OF ELECTRO-ACOUSTICAL TRANSDUCERS

Tutorials

Attendees will be able to choose between different tutorials offered Monday and Tuesday for 2 hours. Please see a selection below.

- HOW TO MEASURE TS PARAMETERS ACCURATELY
- HOLOGRAFIC LOUDSPEAKER MEASUREMENT
- LOUDSPEAKERS FOR AUTOMOTIVE APPLICATIONS
- SYSTEMATIC LISTENING TESTS USING AURALIZATION TECHNIQUES
- HOW TO MEASURE MICROSPEAKERS
- INTRODUCTION TO ADAPTIVE NONLINEAR CONTROL

This is a selection only.
Subject to changes.

[More Information](#)

More Information

Date and Time:

13.-15.03.2017 (9am - 5 pm)

Address:

Dresden University of Technology
Gerber-Bau (Room: GER 038)
Bergstraße 53
01069 Dresden, Germany

Language:

English

Registration Fee:

360 € (VAT incl.)

Contact:

Contact Jasmin for more information about agenda and your registration.

Jasmin Klaue

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[Register now!](#)

CONTENT

ELECTRO-ACOUSTICAL MODELLING:

- Fundamentals - transduction, vibration, radiation
- Abstraction - models with lumped and distributed parameters
- Small Signal Performance - linear approximation and transfer function
- Large Signal Performance - thermal dynamics and nonlinearities
- Time-varying properties - influence of climate and aging

MEASUREMENTS AND ANALYSIS:

- Persistent excitation - artificial and natural stimuli
- Monitored signals - electrical, mechanical and acoustical sensors
- Complex structures - digital and analogue components
- Sound field - measurements in the near and far field
- Interaction with the room - direct and diffuse sound part
- Measurement time - ultra-fast and long-term (power) testing
- Distortion analysis - linear and nonlinear components
- System identification - optimal fitting and parameter estimation
- Transformations - Fourier, wavelet and perceptual modelling
- Data compression - separation of unique and redundant information

INTERPRETATION AND DIAGNOSTICS:

- Interpretation - measured symptoms and physical causes
- Perception - audibility and impact on perceived sound quality
- Evaluation - selection of optimal drive units for system design
- Specification - minimal but comprehensive set of data
- Tolerances - variation of parameters and influences

NEW TOPICS ADDRESSED THIS YEAR:

- Measurement of the nonlinear mechanical damping
- Air nonlinearities in leaky boxes
- Experimental modal analysis
- Measurement of smart-phones
- Active stabilization of voice coil rest position

TUTORIALS



Tutorials will be offered on Monday and Tuesday from 15:00 to 17:00.
Attendees can choose one option per day.
Notifications of subscriptions will be sent out at the end of February by Jasmin.

MONDAY, MARCH 13TH, 2016

Topics to be confirmed

TUESDAY, MARCH 14TH, 2016

Topics to be confirmed

EVENING PROGRAMM

MONDAY NIGHT, MARCH 13TH - HOUSE-PARTY AT KLIPPEL OFFICE

It has become a tradition that on Monday night we all meet up at the KLIPPEL office.

In between finger food, drinks and **live music** there are some great opportunities for **further networking** and knowledge exchange. Bring your instrument and **join the band** for a spontaneous **jam session**.

We will also organise an **in-house exhibition** which will give you the opportunity to have a closer look at how we work and to get to know our engineers. You are welcome to bring your speakers for measurements.

Everyone is welcome. No prior sign-up required.

Address: KLIPPEL GmbH, Mendelssohnallee 30, 01309 Dresden (T.: 0351-5019390)

TUESDAY, MARCH 14TH - CHAMPAGNE RECEPTION AT THE MATHEMATISCH PHYSIKALISCHER SALON

KLIPPEL GmbH is celebrating its 20th company anniversary in 2017.

You are invited to join Wolfgang and Uta Klippel on Tuesday night for a Champagne Reception and guided tours through the oldest museum of the **Dresden Zwinger** - the **Mathematisch-Physikalischer Salon**.

August the Strong founded this museum in 1728. Up until today it contains a remarkable collection of scientific instruments for measuring the world.

Prior sign up required. No extra fee.

Address: Zwinger, Dresden