
TECHNISCHE UNIVERSITÄT DARMSTADT

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Fraunhofer LBF

We welcome you to the

# 15th SIRM European Conference on Rotordynamics

22nd – 24th February 2023

## Technische Universität Darmstadt

# SIRM 2023
# The 15th European Conference on Rotordynamics
## Darmstadt, Germany, 22nd -24th February 2023

Organized by

**Institute for Mechatronic Systems in Mechanical Engineering (IMS),**
Technische Universität Darmstadt, Darmstadt, Germany
**&**
**Fraunhofer LBF,**
Darmstadt, Germany

## WELCOME TO THE 15th SIRM CONFERENCE

It is our great honor and pleasure to host the SIRM Conference after 2003 and 2011 for the third time in Darmstadt. Rotordynamics covers a huge variety of different applications and challenges which are all in the scope of this conference. A keynote lecture given by Rainer Nordmann, one of the three founders of SIRM "Schwingungen in rotierenden Maschinen", will open the conference. In total 54 papers passed our strict review process and will be presented. This impressively shows that rotordynamics is relevant as ever. These contributions cover a very wide spectrum of session topics: fluid bearings and seals; air foil bearings; magnetic bearings; rotor blade interaction; rotor fluid interactions; unbalance and balancing; vibrations in turbomachines; vibration control; instability; electrical machines; monitoring, identification and diagnosis; advanced numerical tools and nonlinearities as well as general rotordynamics.

The international character of the conference has been significantly enhanced by the Scientific Board since the last SIRM two years ago resulting on one hand in an expanded Scientific Committee which now consists of 29 members from 13 different European countries and on the other hand in the new name "European Conference on Rotordynamics". This new international profile is also emphasized by this year's participants coming from 17 different countries and out of three continents.

An important goal of the conference is to promote a vital discussion and dialogue between industry and academia. As roughly 1/3 of the papers are presented by industry and 2/3 by academia this is an excellent basis to follow a bidirectional transfer what we call *xchange* at Technical University of Darmstadt. At this point we also want to give our special thanks to the eleven industry sponsors for their great support of the conference.

In the name of the Darmstadt Local Committee I wish you three very interesting conference days with new inspirations, good discussions and reactivation of personal relationships as we can fortunately move back from virtual format to presence again.

Darmstadt, February 2023

Stephan Rinderknecht

## CONFERENCE VENUE

The conference will take place in the historical university building of the Technical University of Darmstadt**.**

**Address:** Altes Hochschulgebäude Building No S1|03, Hochschulsstraße 1, 64289 Darmstadt

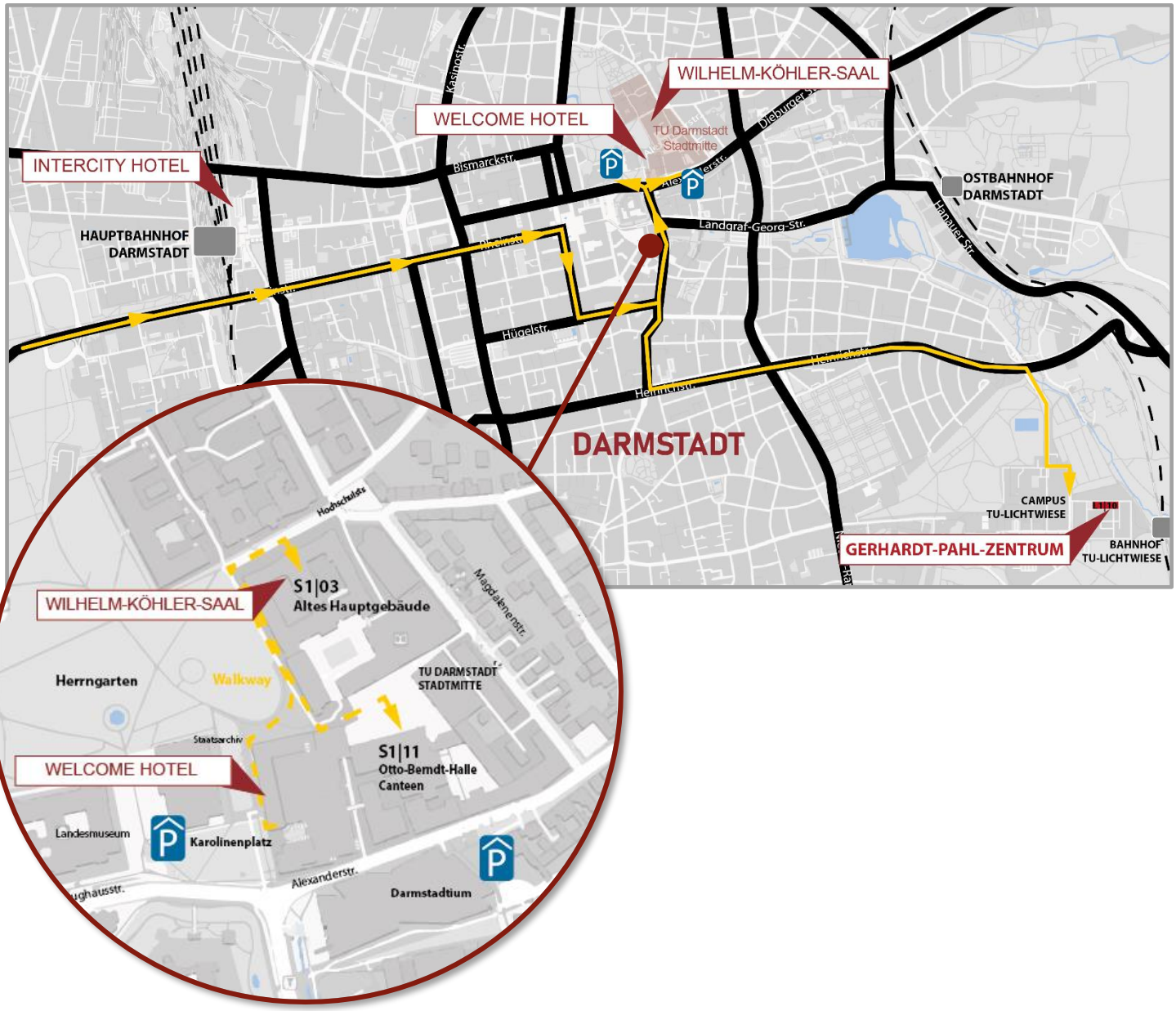
**Sessions**, 2nd Floor: Wilhelm-Köhler-Saal Room No 283 & Auditorium (Hörsaal) Room No 223

**Meeting Sientific Committee:** Building No S1|03, 1st Floor Room 113

**Conference Dinner:** Otto-Berndt-Halle, Building No S1|11

**Lunch Breaks**: Building No S1|03, 1st Floor Room 107 & 2nd Floor Room 209

**Lab-Tour:** Gerhard-Pahl-Zentrum, Campus Lichtwiese, Building No L1|10, Meeting Point Foyer Room 284



**Arrival by public transport:**

**From the main station & Intercity Hotel:**
Take tram lines 3 & 5 from the main station to Willi-Brandt-Platz, from there walk (approx. 400 m) through the Herrngarten to the old main building (approx. 18 min in total).
Bus lines K & 671 to Willi-Brandt-Platz, from there on foot (approx. 400 m) through the Herrngarten to the old main building (approx. 18 min in total).

**From the Welcome Hotel:**
Footpath (see sketch above, approx. 450 m, approx. 5 min) along the Herrngarten.

**We recommend the HeagMobilio APP (map with real-time locations).**

**Arrival by car:**
You can reach Darmstadt via the motorways A5 (from Frankfurt/M. - Heidelberg/Basel) and A67 (from Cologne/Wiesbaden - Mannheim). At the Darmstadt motorway junction, take the Darmstadt/Stadtmitte exit. Follow the Rheinstraße/B26 along the signs Darmstadt/Stadtmitte into the City-Ring-Tunnel. In the City-Ring-Tunnel, take the left exit and turn left at the following traffic lights into Kirchstraße. Continue until you reach the second set of traffic lights (the castle is on your left and the Darmstadtium on your right). Here you can turn right into Alexanderstraße until you reach the entrance to the Darmstadtium multi-storey car park or turn left into Zeughausstraße until you reach the entrance to the Schlossgarage/Karolinenplatz multi-storey car park on the right-hand side.

# WEDNESDAY, FEBRUARY 22nd, 2023

| | | |
|---|---|---|
| **09:30 – 10:30** | **CONFERENCE OPENING**<br>**Location: Wilhelm-Köhler-Saal, S1\|03 Room 283** | |
| **09:30 – 09:45** | Opening**: Stephan Rinderknecht** | |
| **09:45 – 10:30** | Keynote**: Rainer Nordmann**<br>***New Challenges in Rotordynamics for Industry and Academia*** | |
| **10:30 – 11:00** | **Coffee Break, Foyer, Room 284** | |
| **11:00 – 12:30** | **SESSION 1** | |
| | **1a: Vibrations in Turbomachines I**<br>**Session-Chair: Paolo Pennacchi, Politechnico Milano**<br>**Wilhelm-Köhler-Saal, Room 283** | **1b: Fluid Bearings and Seals I**<br>**Session-Chair: Katia L. Cavalca, University of Campinas, Brazil**<br>**Auditorium, Room 223** |
| **11:00 – 11:30** | **Turbine Wheel Reduced Modal Model for Self-Excited Vibration Suppression by Inter-Blade Dry-Friction Damping** (34)<br>Ludek Pesek, Pavel Snabl and Chandra Shekhar Prasad,<br>*Czech Academy of Science, Czech Republic* | **Influence of the Lomakin Effect on the Performance of Journal Bearings and Annular Seals for Steady-State and Dynamic Operation Conditions** (28)<br>Robin Robrecht and Peter Pelz<br>*Technische Universität Darmstadt, FST, Germany* |
| **11:30 – 12:00** | **Vibration Reduction on a Sewage Pump** (41)<br>Jochen Hartmann,<br>*KSB SE & Co. KGaA, Germany* | **Reynolds Equation'S Dimension Reduction Using Galerkin Method for Journal Bearings** (59)<br>Sudhakar Gantasala, Christoph Baum and Panagiotis Koutsovasilis**,** *BorgWarner Systems Engineering GmbH, Germany* |
| **12:00 – 12:30** | **Methods to Experimentally Identify Relevant Drive Train Vibration Modes for Tonality Mitigation of Wind Turbines** (74)<br>Philipp Zech, Oliver Eichelhard, Jonnhy Tchuindjang and Manuel Eckstein<br>*Wölfel Engineering GmbH + Co. KG, Germany* | **Influence of Fluid-Film-Cavitation on the Dynamics, Stability and Oscillation Behavior of High-Speed Rotor Systems** (64)<br>Huaxin Dong and Bernhard Schweizer<br>*Technische Universität Darmstadt, AD, Germany* |
| **12.30 – 14.00** | **Lunch Break, 2nd Floor Room 209 and 1st Floor Room 107** | |
| **14:00 – 15:30** | **SESSION 2** | |
| | **2a: Vibrations in Turbomachines II**<br>**Session-Chair: Ludek Pesek, Czech Academy of Science, Czech Republic**<br>**Wilhelm-Köhler-Saal, Room 283** | **2b: Fluid Bearings and Seals II**<br>**Session-Chair: Jaroslav Zapoměl, VSB - Technical University of Ostrava, Czech Republic**<br>**Auditorium, Room 223** |
| **14:00 – 14:30** | **Bearing Damage Manifested by Extremely High Half-Speed Subharmonic Vibration on a Steam Turbine Generator** (9)<br>John Yu and Nicolas Peton<br>*Baker Hughes/Bently Nevada, USA* | **Experimental Identification of the Force and Moment Characteristic of Symmetrically and Non-Symmetrically Profiled Annular Seals** (24)<br>Maximilian Kuhr and Peter Pelz<br>*Technische Universität Darmstadt, FST, Germany* |
| **14:30 – 15:00** | **Turbocharger Rotors with Wire Mesh Dampers: Sensitivity and Optimization Analysis in Rotor Dynamic Design** (44)<br>Alexios Chatzistavris and Athanasios Chasalevris<br>*National Technical University of Athens, Greece* | **Study on Localized Defect Model and Identification in Elastohydrodynamic Lubricated Ball Bearings Using Support Vector Machine** (45)<br>Laís Carrer, Luis Otavio Garavaso, Gregory Bregion Daniel, Tiago Henrique Machado and Katia Lucchesi Cavalca<br>*University of Campinas, Brazil* |
| **15:00 – 15:30** | **Advancements in the Rotor Dynamic Optimization of Heavy Duty Gas Turbines – Handling Complexity in the Industrial Practice** (75)<br>Eric Knopf, Mateusz Golebiowski, David Stacy and Daryl Collins<br>*General Electric Gas Power, Switzerland* | **Database Approach for Force Calculation of Journal Bearings with Oil Feed Holes: An Application to Turbo-charger Bearings** (69)<br>Sudhakar Gantasala, Panagiotis Koutsovasilis and Christoph Baum<br>*BorgWarner Systems Engineering GmbH, Germany* |

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|---|---|---|
| **15:30 – 16:00** | **Coffee Break, Foyer, Room 284** | |
| **16:00 – 17:30** | **SESSION 3** | |
| | **3a: Vibrations in Turbomachines III**<br>**Session-Chair: Franz Heitmeir,**<br>**Graz University of Technology, Austria**<br>**Wilhelm-Köhler-Saal, Room 283** | **3b: Air Foil Bearings I**<br>**Session-Chair: Ilmar Santos,**<br>**Technical University of Denmark, Denmark**<br>**Auditorium, Room 223** |
| **16:00 – 16:30** | **Finite Element Analysis of Flexible Stator and Rotordynamic Design of Gas Turbine** (5)<br>Zhiqiang Meng, Richard Bluck and Caroline Raick<br>*Siemens Energy Industrial Turbomachinery Ltd., UK* | **Simulation of the Mixed Lubrication Regime of Foil-Air Bearings** (8)<br>Arved Heß and Jens Weber<br>*HTWG Konstanz, Germany* |
| **16:30 – 17:00** | **Experimental Dynamic Characteristics of a Gas Micro-turbine with a Supercritical Rotor Supported by a Hybrid Bearing System** (26)<br>Grzegorz Żywica, Paweł Bagiński and Artur Andrearczyk<br>*Polish Academy of Sciences, Poland* | **Simulation of Foil Bearing Supported Rotor Systems** (32)<br>Steffen Nitzschke, Elmar Woschke and Christian Daniel<br>*Otto von Guericke University Magdeburg, Germany* |
| **17:00 – 17:30** | **Design and Optimization of Squirrel Cage Geometries in Aircraft Engines Toward Robust Whole Engine Dynamics** (51)<br>Ioannis Chatzisavvas, Ilya Arsenyev and Rene Grahnert<br>*MTU Aero Engines AG, Germany* | |
| **18:00 – 19:00** | **MEETING SCIENTIFIC COMMITTEE**<br>**Building S1\|03 Room 113, 1st Floor** | |

# THURSDAY, FEBRUARY 23rd, 2023

| 08:30 – 10:30 | **SESSION 4** | |
|---|---|---|
| | **4a: General Rotordynamics I**<br>**Session-Chair: Horst Ecker,**<br>**Technical University Vienna, Austria**<br>**Wilhelm-Köhler-Saal, Room 283** | **4b: Monitoring, Identification and Diagnosis**<br>**Session-Chair: Tomasz Szolc,**<br>**Polish Academy of Sciences, Poland**<br>**Auditorium, Room 223** |
| **08:30 – 09:00** | **Rotor Dynamic Excitation Due to Non-Axisymmetric Static Loading** (2)<br>Angel Martinez<br>*Industria de Turbopropulsores, ITP, Spain* | **Generalised Few-Shot Learning for Rotor System Diagnosis** (29)<br>Aleksanteri Hämäläinen, Aku Karhinen, Jesse Miettinen and Raine Viitala<br>*Aalto University, Finland* |
| **09:00 – 09:30** | **Thrust Collar Induced Vibrations of a Pinion Shaft in an Integral Gear Unit** (63)<br>Bastian Pfau<br>*VOITH Turbo, Germany* | **Evaluation of the Extended Kalman Filter in the Identification of Roller Bearing Total Parameters** (48)<br>Danilo Alvaro da Silva, Gregory Bregion Daniel, Katia Lucchesi Cavalca and Natalia Akemi Hoshikawa Tsuha<br>*University of Campinas, Brazil* |
| **09:30 – 10:00** | **A Fundamental Investigation of the Interaction and Impact of Controlled Torque Ripples on Gear Mesh Dynamics** (69)<br>Sidharth Dave, Jessica Neufond, Rainer Nordmann and Stephan Rinderknecht<br>*Technische Universität Darmstadt, IMS, Germany* | **Fault Diagnosis on Rotating Systems with Big Data Analytics** (79)<br>Lucas Papacharalabos and Pantelis Nikolakopoulos<br>*University of Patras, Greece* |
| **10:00 – 10:30** | **Coupled Torsional–Bending Vibration Analysis of the Ship'S Propulsion Shaft with a Residual Shaft Bow** (70)<br>Sanjin Braut, Alen Marijančević, Roberto Žigulić and Ante Skoblar<br>*University of Rijek, Croatia* | **Data-Driven Virtual Sensor for Powertrains Based on Transfer Learning** (12)<br>Aku Karhinen, Aleksanteri Hämäläinen, Mikael Manngård, Jesse Miettinen and Raine Viitala<br>*Aalto University, Finland* |
| **10.30 – 11.00** | **Coffee Break, Foyer, Room 284** | |
| **11:00 – 12:30** | **SESSION 5** | |
| | **5a: General Rotordynamics II**<br>**Session-Chair: Sanjin Braut,**<br>**University of Rijeka, Croatia**<br>**Wilhelm-Köhler-Saal, Room 283** | **5b: Electrical Machines**<br>**Session-Chair: Timo Holopainen**<br>**ABB Large Motors and Generators, Finland**<br>**Auditorium, Room 223** |
| **11:00 – 11:30** | **Numerical Investigation of Rotor-Bearing Systems with Fractional Derivative Material Damping Models** (18)<br>Gregor Überwimmer, Georg Quinz, Michael Klanner and Katrin Ellermann<br>*Graz University of Technology, Austria* | **Effect of Motor Control on Torsional Vibration Response in Variable Speed Drive Systems** (16)<br>Urho Hakonen, Sampo Laine, Sampo Haikonen and Raine Viitala<br>*Aalto University, Finland* |
| **11:30 – 12:00** | **Validating Torsional Measurements from Different Sources** (39)<br>Brian Howard<br>*Bently Nevada, USA* | **Maximum Torques Due to Electrical Reclosures for Drivetrain Components of Motor Driven Reciprocating Compressors** (35)<br>Timo Holopainen and Tommi Ryyppö<br>*ABB Oy, Finland* |
| **12:00 – 12:30** | **Vibratory Response of Planetary Gear Sets by a Spectral Iterative Approach – Modulation Effects Induced by Carrier Rotation** (71)<br>Jessica Neufond, Joël Perret-Liaudet, Emmanuel Rigaud and Pascal Bouvet<br>*VIBRATEC & Ecole Centrale de Lyon, France* | **Torsional Vibration Control of the Rotating Machine Shaft-Line by Means of the Driving Asynchronous Motor** (40)<br>Paweł Hańczur, Tomasz Szolc and Robert Konowrocki<br>*Polish Academy of Sciences, Poland* |
| **12:30 – 14:00** | **Lunch Break, 2nd Floor Room 209 and 1st Floor Room 107** | |

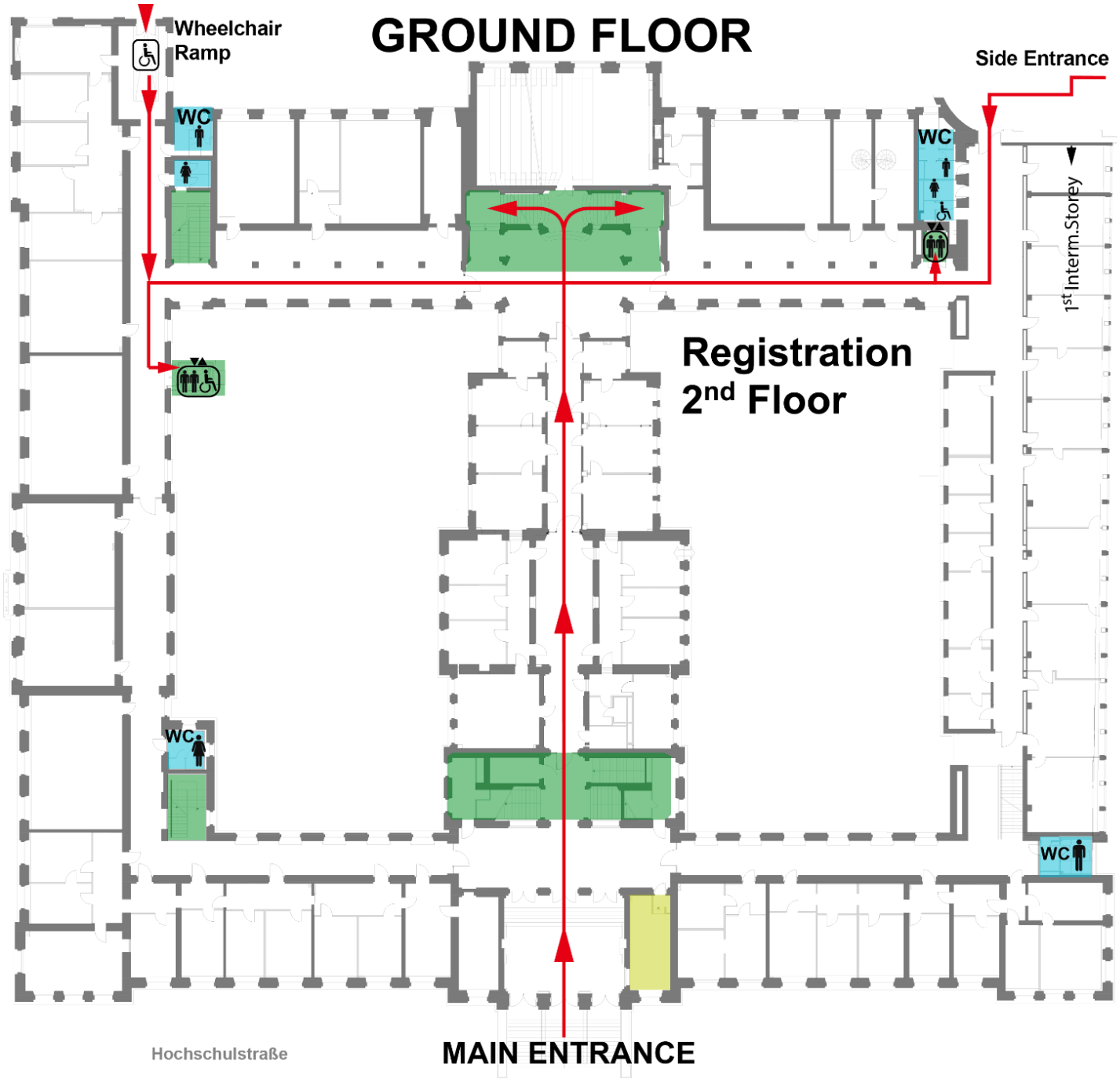
| 14:00 – 15:30 | **SESSION 6** | |
|---|---|---|
| | **6a: Magnetic Bearings**<br>**Session-Chair: Joachim Schmied,**<br>**DELTA JS AG, Switzerland**<br>**Wilhelm-Köhler-Saal, Room 283** | **6b: Rotor Blade Interaction**<br>**Session-Chair: Eric Knopf,**<br>**General Electric Gas Power, Switzerland**<br>**Auditorium, Room 223** |
| **14:00 – 14:30** | **Adapting the Control of the Magnetic Bearings of a Highly Flexible and Gyroscopic Rotor to the Excitations by the Motor** (47)<br>Daniel Franz, Benedikt Schüßler and Stephan Rinderknecht<br>*Technische Universität Darmstadt, IMS, Germany* | **Investigations on Laterally Coupled Rotor-Blade-Vibrations** (30)<br>Klaus-Dieter Schlesier, Lars Panning-von Scheidt, Ulrich Ehehalt and Roland Levin Rojas<br>*Leibniz University Hannover, Germany* |
| **14:30 – 15:00** | **Analysis of the Influence of Axial Forces on the Permanent Magnet Bearing of a Turbopump and Methods to Reduce the Magnetic Bearing Error** (27)<br>Pascal Wielsch and Gerd Manthei<br>*Technische Hochschule Mittelhessen, Germany* | **Geometrically Mistuned Blisks: Strain Gauge and Tip Timing Vibration Measurements of Rotating Blades with and Without Underplatform Dampers** (65)<br>Katharina Brinkmann, Lars Panning-von Scheidt and Heinrich Stüer<br>*Leibniz University Hannover, Germany* |
| **15:00 – 15:30** | **An Alternative Active Hybrid Fluid-Magnetic Bearing System for Rotor Dynamic Control** (55)<br>Diogo Stuani Alves, Nicola Bailey and Patrick Keogh<br>*University of Bath, UK* | **Geometrically Mistuned Blisks: Assessment of Geometric Uncertainties and Finite-Element Mesh Morphing** (66)<br>Ulrik Strehlau, Denny Langheinrich, Bernd Beirow, Yue Xiao and Lars Panning-von Scheidt<br>*Leibniz University Hannover, Germany* |
| **15:30 – 16:00** | **Coffee Break, Foyer, Room 284** | |
| **16:00 – 17:00** | **SESSION 7** | |
| | **7a: Unbalance and Balancing**<br>**Session-Chair: Jens Strackeljan**<br>**Otto-von-Guericke Universität Magdeburg, Germany**<br>**Wilhelm-Köhler-Saal, Room 283** | **7b: Instability**<br>**Session-Chair: Nicolò Bachschmid,**<br>**Politecnico Milano, Italy**<br>**Auditorium, Room 223** |
| **16:00 – 16:30** | **Multi-Harmonic Unbalance Response of Air-craft Jet En-Gine Rotors on Squeeze Film Dampers** (52)<br>Georgios Mitsos, Ioannis Chatzisavvas and Athanasios Chasalevris<br>*MTU Aero Engines, Germany* | **Self-Excited Vibration Cases in Critical Machinery, Part 2: Parametric Subsynchronous Vibration** (21)<br>Piotr Mialkowski and Nicolas Peton<br>*Baker Hughes/Bently Nevada, Poland/France* |
| **16:30 – 17:00** | **Field Balancing of Flexible Rotors Without Trial Runs Using the Numerical Assembly Technique** (56)<br>Georg Quinz, Gregor Überwimmer, Michael Klanner and Katrin Ellermann,<br>*Graz University of Technology, Austria* | |
| **17:00 – 17:30** | **TRANSFER TO LAB TOUR**<br>**Meeting point: Foyer, Room 284** | |
| **17:30 – 18:30** | **LAB TOUR**<br>**Gerhard-Pahl-Zentrum, Campus Lichtwiese** | |
| **19:00 – 24:00** | **CONFERENCE DINNER**<br>**Otto-Berndt-Halle, Building S1\|11** | |

# FRIDAY, FEBRUARY 24th, 2023

| 08:30 – 10:30 | **SESSION 8** | |
|---|---|---|
| | **8a: Advanced Numerical Tools and Nonlinearities**<br>**Session-Chair: Katrin Ellermann,**<br>**Graz University of Technology, Austria**<br>**Wilhelm-Köhler-Saal, Room 283** | **8b: Vibration Control**<br>**Session-Chair: Robert Liebich,**<br>**Technische Universtität Berlin, Germany**<br>**Auditorium, Room 223** |
| **08:30 – 09:00** | **Reduced Order Models of Rotating Machines Considering Nonlinear Effects** (31)<br>Arthur Mereles, Diogo Stuani Alves and Katia Lucchesi Cavalca<br>*University of Campinas, Brazil* | **Semi-Active Foundation Stiffness Control for Rotor Resonance Avoidance** (14)<br>Sampo Laine, Sampo Haikonen and Raine Viitala<br>*Aalto University, Finland* |
| **09:00 – 09:30** | **Numerical Investigations on Rotor Systems with Air Ring Bearings: Nonlinear Vibration Behavior and Optimization** (49)<br>Pascal Zeise and Bernhard Schweizer<br>*Technische Universität Darmstadt, AD, Germany* | **Exploiting Gyroscopic Effects for Resonance Elimination of an Elastic Rotor Utilizing Only One Piezo Actuator** (17)<br>Jens Jungblut, Daniel Franz, Christian Fischer and Stephan Rinderknecht<br>*Technische Universität Darmstadt, IMS, Germany* |
| **09:30 – 10:00** | **Nonlinear Vibrations Analysis of a High Speed Turbo-charger Rotor in Ball Bearings - Simulation and Measurement** (57)<br>Christoph Baum, Jürgen Brezina, Sudhakar Gantasala and Panagiotis Koutsovasilis<br>*BorgWarner Systems Engineering, Germany* | **Vibration Reduction on Circular Saw Blades with Vibroacoustic Metamaterials** (23)<br>Sebastian Riess, William Kaal and Sven Herold<br>*Fraunhofer Institute for Structural Durability and System Reliability LBF, Germany* |
| **10:00 – 10:30** | **Application of the Fuzzy Number Method for Analysis of Nonlinear Vibration of Rotor Systems with Uncertain Parameters** (4)<br>Jaroslav Zapoměl, Petr Ferfecki, Michal Molčan and Jan Kozánek<br>*Czech Academy of Science, Czech Republic* | **Effectivity of Particle Dampers with Granular Filling Under Rotating Conditions** (42)<br>Christian Daniel, Elmar Woschke, Braj Bhushan Prasad and Fabian Duvigneau<br>*Otto-von-Guericke Universität Magdeburg, Germany* |
| **10.30 – 11.00** | **Coffee Break, Foyer, Room 284** | |
| **11:00 – 12:30** | **SESSION 9** | |
| | **9a: Rotor Fluid Interactions**<br>**Session-Chair: Elmar Woschke,**<br>**Otto von Guericke University Magdeburg, Germany**<br>**Wilhelm-Köhler-Saal, Room 283** | **9b: Air Foil Bearings II**<br>**Session-Chair: Grzegorz Zywica,**<br>**Polish Academy of Sciences, Poland**<br>**Auditorium, Room 223** |
| **11:00 – 11:30** | **Efficient Rotordynamic Simulations with Semi-Analytical Computation of Hydrodynamic Forces** (6)<br>Simon Pfeil, Fabian Duvigneau and Elmar Woschke<br>*Otto-von-Guericke Universität Magdeburg, Germany* | **Changes in the Friction Torque of an Active Foil Bearing** (38)<br>Lukasz Breńkacz, Paweł Bagiński and Artur Andrearczyk<br>*Polish Academy of Sciences, Poland* |
| **11:30 – 12:00** | **Generalised Sommerfeld'S Lubricants Theory Supported by Molecular Dynamics Simulation of Slip Length** (58)<br>Seyedmajid Mehrnia, Maximilan Kuhr and Peter Pelz<br>*Technische Universität Darmstadt, FST, Germany* | **Controlling Bifurcations in High-Speed Rotors Utilizing Active Gas Foil Bearings** (43)<br>Anastasios Papadopoulos, Ioannis Gavalas and Athanasios Chasalevris<br>*National Technical University of Athens, Greece* |
| **12:00 – 12:30** | **Numerical Evaluation of Alford Forces Acting on an Axial Expander for Supercritical $CO_2$ Application** (81)<br>Edoardo Gheller, Steven Chatterton, Lorenzo Cosi, Gabriele Girezzi, Alessandro De Luca and Paolo Pennacchi<br>*Politecnico di Milano& Baker Hughes, Italy* | **Thermo-Elasto-Hydrodynamic Analysis of Bump-Type Air Foil Thrust Bearings Considering Misalignment** (50)<br>Markus Eickhoff, Johannis Triebwasser and Bernhard Schweizer<br>*Technische Universität Darmstadt, AD, Germany* |
| **12:30– 13:00** | **CONFERENCE CLOSING & ANOUNCEMENT OF SIRM 2025**<br>**Stephan Rinderknecht \| Wilhelm-Köhler-Saal, Room 283** | |
| **13:00** | **Farewell with Lunch Pack** | |

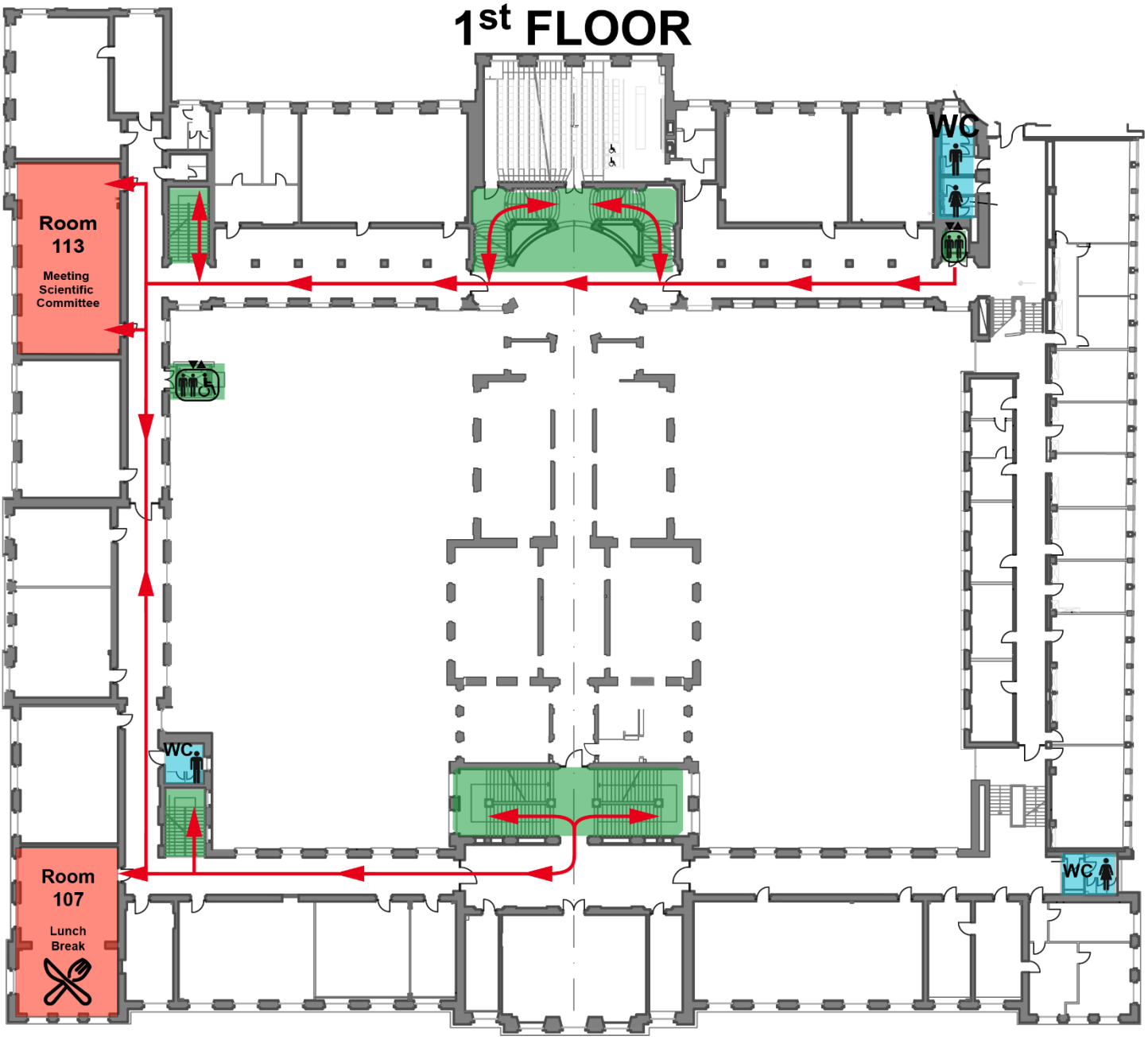
## SITE MAP

### Altes Hauptgebäude S1|03, Ground Floor, Main Entrance



**Altes Hauptgebäude, 1st Floor,**

**Lunch Breaks → Room 107 (and 2nd Floor Room 209)**
**Meeting Scientific Committee → Room 113**

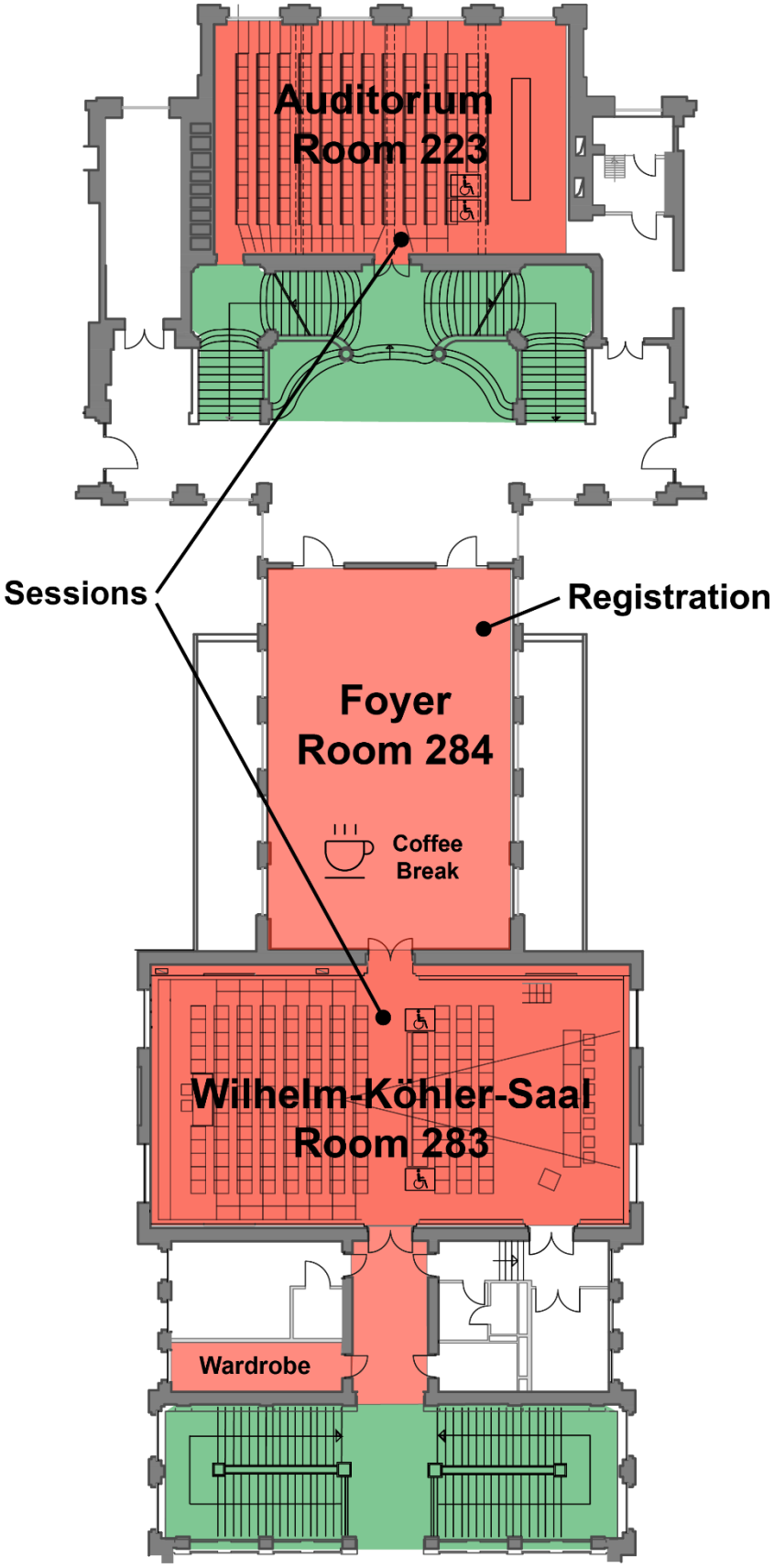


**Altes Hauptgebäude, 2nd Floor**

**Sessions → Wilhelm-Köhler-Saal, Room 283 & Auditorium (Hörsaal), Room 223**
**Coffee Breaks → Foyer, Room 284**
**Lunch Breaks → Room 209 (and 1st Floor Room 107)**

**Altes Hauptgebäude, 2nd Floor, Close Up**

**Sessions → Wilhelm-Köhler-Saal, Room 283 & Auditorium, Room 223**
**Coffee Breaks → Foyer, Room 284**
**Lunch Breaks → Room 209 (and 1st Floor Room 107)**



## PROGRAMME SCHEDULE

| | | |
|---|---|---|
| **WEDNESDAY, FEBRUARY 22nd, 2023** | | |
| **09:30 – 10:30** | **CONFERENCE OPENING**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | |
| **10:30 – 11:00** | **Coffee Break, Foyer, Room 284** | |
| **11:00 – 12:30** | **SESSION 1** | |
| | **1a: Vibrations in Turbomachines I**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **1b: Fluid Bearings and Seals I**<br>Auditorium S1\|03 Room 223 |
| **12.30 – 14.00** | **Lunch Break: 1st Floor Room 107, 2nd Floor Room 209** | |
| **14:00 – 15:30** | **SESSION 2** | |
| | **2a: Vibrations in Turbomachines II**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **2b: Fluid Bearings and Seals II**<br>Auditorium S1\|03 Room 223 |
| **15:30 – 16:00** | **Coffee Break, Foyer, Room 284** | |
| **16:00 – 17:30** | **SESSION 3** | |
| | **3a: Vibrations in Turbomachines III**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **3b: Air Foil Bearings I**<br>Auditorium S1\|03 Room 223 |
| **18:00 – 19:00** | **MEETING SIENTIFIC COMMITTEE**<br>Building S1\|03 Room 113, 1st Floor | |
| **THURSDAY, FEBRUARY 23rd, 2023** | | |
| **08:30 – 10:30** | **SESSION 4** | |
| | **4a: General Rotordynamics I**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **4b: Monitoring, Identification and Diagnosis**<br>Auditorium S1\|03 Room 223 |
| **10.30 – 11.00** | **Coffee Break, Foyer, Room 284** | |
| **11:00 – 12:30** | **SESSION 5** | |
| | **5a: General Rotordynamics II**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **5b: Electrical Machines**<br>Auditorium S1\|03 Room 223 |
| **12:30 – 14:00** | **Lunch Break: 1st Floor Room 107, 2nd Floor Room 209** | |
| **14:00 – 15:30** | **SESSION 6** | |
| | **6a: Magnetic Bearings**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **6b: Rotor Blade Interaction**<br>Auditorium S1\|03 Room 223 |
| **15:30 – 16:00** | **Coffee Break, Foyer, Room 284** | |
| **16:00 – 17:00** | **SESSION 7** | |
| | **7a: Unbalance and Balancing**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **7b: Instability**<br>Auditorium S1\|03 Room 223 |
| **17:00 – 17:30** | **Transfer to LAB TOUR**<br>Meeting Point: Foyer, Room 284 | |
| **17:30 – 18:30** | **LAB TOUR**<br>Gerhardt-Pahl-Zentrum, Campus Lichtwiese | |
| **19:00 – 24:00** | **CONFERENCE DINNER**<br>Otto-Berndt-Halle, Building S1\|11 | |
| **FRIDAY, FEBRUARY 24th, 2023** | | |
| **08:30 – 10:30** | **SESSION 8** | |
| | **8a: Advanced Numerical Tools and Nonlinearities**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **8b: Vibration Control**<br>Auditorium S1\|03 Room 223 |
| **10.30 – 11.00** | **Coffee Break, Foyer, Room 284** | |
| **11:00 – 12:30** | **SESSION 9** | |
| | **9a: Rotor Fluid Interactions**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | **9b: Air Foil Bearings II**<br>Auditorium S1\|03 Room 223 |
| **12:30– 13:00** | **CONFERENCE CLOSING & ANOUNCEMENT OF SIRM 2025**<br>Wilhelm-Köhler-Saal, S1\|03 Room 283 | |
| **13:00** | **Farewell with Lunch Pack** | |

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