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# COLLOQUIUM

## 23<sup>rd</sup> International Colloquium Tribology

Industrial and Automotive Lubrication

Event No. 50019.00.007

25 – 27 January 2022

in Stuttgart/Ostfildern, Germany

### STEERING COMMITTEE

A. Fatemi

A. Pauschitz

K. Topolovec-Miklozic

ONLINE EVENT

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# 23<sup>rd</sup> International Colloquium Tribology

Join the leading event on the topics of lubrication, additives and tribology in Europe. Our conference provides an international exchange forum for the industry and the academia.

Leading university researchers present their latest findings and representatives of the industry inspire scientists to develop new solutions.

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## PLENARY SPEAKERS

### Susanne Beyer-Faiss

Dr. Tillwich GmbH Werner Stehr, Horb, Germany  
**Novel Nanocomposite with Ionic Liquid and Graphene for Electroconductive Radial Plain Bearings**



### Dr. Steffen Glänzer

Clariant Lubricants, Frankfurt, Germany  
**Base Oil Benchmarking for Gear Oils in Electric Vehicle Drivetrains**



### Inga Herrmann

VSI Verband Schmierstoff-Industrie e.V., Hamburg, Germany  
**Different Dimensions of Sustainability**



### Dr. Ken Hope

Chevron Phillips Chemical Company, USA  
STLE President 2021-2022  
**From Emerging Trends to Current Lubrication Challenges: STLE's View**



### Prof. Roland Larsson

Luleå University of Technology, Luleå, Sweden  
**Tribological Optimisation for Sustainable Lubrication Design**



### Dr. Lutz Lindemann

FUCHS PETROLUB SE, Mannheim, Germany  
**E-Mobility – Raw Materials – Markets**



### Prof. Denis Mazuyer

Ecole Centrale de Lyon, Ecully, France  
**An Innovative Approach to Reduce Friction in Transport from Hydrodynamics to Boundary Regime**



### Franz Pirker

AC2T research GmbH, Wiener Neustadt, Austria  
**Tribology in the Age of Digitalization and Green Deal – Building Digital Services!**



### Dr. Volker Weihnacht

Fraunhofer IWS, PVD- and Nanotechnology Dresden, Germany  
**Vacuum Tribology of Superhard ta-C Coatings**



## LINKEDIN GROUP

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1. go to [www.linkedin.com](https://www.linkedin.com)
2. search for „International Colloquium Tribology – TAE“ or use QR-Code



### STEERING COMMITTEE

**A. Fatemi**, Robert Bosch GmbH, Stuttgart, Germany  
**A. Pauschitz**, AC2T research GmbH, Wiener Neustadt, Austria  
**K. Topolovec Miklozic**, Powertrib Ltd, Oxford, Great Britain

### PROGRAMME PLANNING COMMITTEE

**A. Albers**, Karlsruhe Institute of Technology, Germany  
**D. Bartel**, University Magdeburg, Germany  
**M. Dienwiebel**, Karlsruhe Institute of Technology, Germany  
**N. Dörr**, AC2T Research GmbH, Wiener Neustadt, Austria  
**C. Gachot**, Vienna University of Technology, Austria  
**G. Gaule**, Hermann Bantleon GmbH, Ulm, Germany  
**M. Gleß**, ContactEngineering, Stuttgart, Germany  
**G. Jacobs**, RWTH Aachen University, Germany  
**M. Jungk**, LUBEVISIO GmbH, Brannenburg, Germany  
**T. Kilthau**, Klüber Lubrication München SE & Co. KG, Germany  
**R. Krethe**, OilDoc GmbH, Brannenburg, Germany  
**L. Lindemann**, Fuchs Petrolub SE, Mannheim, Germany  
**M. Matzke**, Robert Bosch GmbH, Renningen, Germany  
**J. Molter**, Mannheim University, Germany  
**J. Müllers**, Robert Bosch GmbH, Stuttgart, Germany

### HEALTH AND SAFETY INFORMATION

The health and safety of all conference participants and employees is our top priority.  
For this reason, we have decided to make the symposium an online-only event.

### ONLINE EVENT



### FURTHER INFORMATION AND REGISTRATION:

[www.tae.de/go/tribology](http://www.tae.de/go/tribology)



Tuesday, 25 January 2022						
11:00	Early Lunch/Arrivals					
	<b>P1 – Plenary Session</b> Chair: Dr. A. PAUSCHITZ, Dr. K. TOPOLOVEC-MIKLOZIC					
11:45	<b>Opening:</b> Michael Walz, CEO Technische Akademie Esslingen e.V. (GER)					
12:00	<b>E-Mobility – Raw Materials – Markets:</b> Dr. Lutz Lindemann, Fuchs Petrolub SE (GER)					
12:30	<b>Different Dimensions of Sustainability:</b> Inga Herrmann, VSI Verband Schmierstoff-Industrie e.V. (GER)					
13:00	<b>Tribological Optimisation for Sustainable Lubrication Design:</b> Prof. Roland Larsson, Luleå University of Technolog (SWE)					
13:30	Break/Exhibition					
	<b>A1 – Novel Lubricant/ Lubrication Concepts</b> (Trends Lubricants and Additives) Chair: M. FRAUSCHER	<b>A2 – Gears</b> (Industrial Machine Elements and Wind Turbine Industry) Chair: Dr. M. JUNGK	<b>A3 – Seals &amp; Polymer Testing</b> (Test Methodologies and Measurement Technologies) Chair: Prof. J. MOLTER	<b>A4 – Lubricants</b> (Automotive and Transport Industry) Chair: N. DÖRR	<b>A5 – Seals &amp; Polymer Testing</b> (Test Methodologies and Measurement Technologies) Chair: Dr. M. GLESS	<b>A6 – Rolling Contact</b> (Digitisation in Tribology) Chair: Dr. L. LINDEMANN
14:00	<b>Liquid Amides – Novel, High Performance Base Oils:</b> Kevin Duncan, Croda Europe Ltd. (UK)	<b>How Friction Modifier Influences the Dynamic Friction Behavior in Wet-Running Clutch Systems and its Potential for Extended Use in Hybrid Drive Trains:</b> Arne Bischofberger, KIT (GER)	<b>Fluorescence Investigation of Wetting in Soft Rough Contacts: Role of Microasperities:</b> Dr. Konstantinos Pagkalis, Università del Salento (ITA)	<b>Impact of Lubricant Formulation on Surface Damage in Electric Vehicle Transmissions:</b> Alexander McLaren, Imperial College London (UK)	<b>Influences of Roughness, Moisture Content and Lubrication on Friction of Polymers Against 100Cr6:</b> Dr. Igor Velkavrh, V-Research GmbH (AUT)	<b>Contact &amp; Lubrication Aspects on Predicting the Contact Area in Lubricated Hot Rolling:</b> André Rudnytskyj, TU Wien (AUT)
14:30	<b>Comparisons of Boundary Lubricant Additive Screening Strategie:</b> Ted McClure, Sea-Land Chemical Company (USA)	<b>Wear Analysis of Spur Gears in Consideration of the Temperature:</b> Prof. Chan IL Park, Gangneung-Wonju National University (KOR)	<b>Accelerated Compatibility Test of Seal Materials and Lubricants in a Dynamic Stress Collective:</b> Dr. Ameneh Schneider, Optimol Instruments Prüftechnik GmbH (GER)	<b>Optimizing the MoDTC Concentration in Low Viscosity Fully Formulated Engine Oils:</b> Aaron Thornley, University of Leeds (UK)	<b>A Novel Measurement Procedure to Analyse the Friction of Rod Seals in Relation to Pre-Defined Shear Rates and Starved Lubrication Conditions:</b> Oliver Feuchtmüller, University of Stuttgart (GER)	<b>Wear Modeling of Non-conformal Rolling Contacts Subjected to Boundary and Mixed Lubrication:</b> Andreas Winkler, Friedrich-Alexander-University Erlangen-Nürnberg (GER)
15:00	<b>Scientific Evaluation of Investigations on the Load Carrying Capacity of Carbide Cylindrical Gears Lubricated with Water:</b> Karl Jakob Winkler, Technical University of Munich (GER)	<b>Design for Reliability (DfR) in Gear Systems Concerning Wear:</b> Poorna Satish Chowdary Maddukuri, Robert Bosch GmbH (GER)	<b>Development and verification of a test method for determining the compatibility of elastomers with cooling lubricants:</b> Stephan Baumgärtel, VSI Verband Schmierstoff-Industrie e.V. (GER)	<b>Rheological Properties of Lubricants and their Correlation with Fuel Economy Performance:</b> Maryam Sepehr, Chevron Oronite Company (USA)	<b>A new Approach for the Friction and Wear Characterization of Polymer Fibers under Dry, Mixed and Hydrodynamic Sliding:</b> Justus Rüthing, Hamm-Lippstadt University of Applied Science (GER)	
15:30	Break/Exhibition					

Continuation Tuesday						
	<b>B1 – Metalworking</b> (Trends Lubricants and Additives) Chair: Dr. K. TERVEEN	<b>B2 – Bearing</b> (Industrial Machine Elements and Wind Turbine Industry) Chair: Prof. D. BARTEL	<b>B3 – Lubricant Stability</b> (Test Methodologies and Measurement Technologies) Chair: R. KRETHE	<b>B4 – Engines</b> (Automotive and Transport Industry) Chair: Dr. M. JUNGK	<b>B5 – Rheology</b> (Test Methodologies and Measurement Technologies) Chair: S. BEYER-FAISS	<b>B6 – Digitisation</b> (Digitisation in Tribology) Chair: J. MÜLLERS
<b>16:00</b>	<b>Development and Characterization of Ultra-Low Foaming Metalworking Fluids:</b> Dr. Marco Bellini, Bellini SpA (ITA)	<b>Effect of Water Absorption in Bearing Greases on Wear and Corrosion:</b> Ivan Delic, AC2T research GmbH (AUT)	<b>Novel Electrical Current Feed Apparatus for Aging Simulation of Lubricants:</b> Yasmin Korth, Dr. Tillwich GmbH Werner Stehr (GER)	<b>In-Bore i/c Engine Component Tribology:</b> Malcolm FOX, University of Bradford (UK)	<b>Observation of Grease Flow by Particle Imaging Velocimetry:</b> Haruka Iki, ENEOS corporation (JPN)	<b>Artificial Intelligence in Tribology – Design of New Dispersants Using Artificial Intelligence</b> <b>Tools:</b> Shin Ho Kim Lee, CIB Margarita Salas (ESP)
<b>16:30</b>	<b>Naphthenic Base Oils – Tailoring Emulsion Stability:</b> Prof. Thomas Norrby, Nynas AB (SWE)	<b>Tribo-Dynamics for a 3D-Printed Multilattice Structure-Based Air-Foil Bearing:</b> Dr. Ali Usman, Lulea University of Technology (SWE)	<b>Thermo-Oxidation Activation Energies of Grease Antioxidants by RapidOxy Method mDIN 51830-2:</b> Dr. Markus Matzke, Robert Bosch GmbH (GER)	<b>Radioactive Tracer Engine Wear Test Development:</b> Dr. Peter Lee, Southwest Research Institute (USA)	<b>Visualization of Grease Distribution in a Ball Bearing Using Neutron Imaging Technology:</b> Kazumi Sakai, ENEOS corporation (JPN)	<b>Digitalization and Lubricant Analyses – an Efficient Partnership:</b> Stefan Mitterer, OELCHECK GmbH (GER)
<b>17:00</b>	<b>Do Biofilms in Metalworking Fluid System Matter?:</b> Dr. Frederick J. Passman, Biodeterioration Control Associates, Inc. (USA)	<b>Static Performance Analysis of a Porous Journal Bearing for Cryogenic Applications:</b> Artur Schimpf, Technical University Kaiserslautern (GER)	<b>Benchmarking of Greases Regarding Mechanical Stability by use of a Grease Worker:</b> Nicole Dörr, AC2T research GmbH (AUT)	<b>Squeeze Film Investigations in a Simulating Piston-Ring Cylinder Liner Experimental Set-up:</b> Dr. Polychronis Dellis, ASPETE, School of Mechanical Engineering Educators (GRE)	<b>High Pressure, High Shear Viscometry – Lubricant Characterization for Highly Loaded Contacts:</b> Lukas Mebus, MSE, RWTH Aachen (GER)	<b>Tribological Experiments in the Age of Big Data:</b> Dr. Nikolay Garabedian, KIT (GER)
<b>17:30</b>	<b>Improving Microbial Control Without Excess Reserve Alkalinity in MWF Formulations:</b> Harish Potnis, Angus Chemical Company (IND)	<b>Early Stages of Subsurface Cracks and WECs in 100Cr6 Steel under Hydrogen Influence:</b> Fernando López, IK4-TEKNIKER (ESP)	<b>Application of the Non-Linear Behaviour of Longitudinal Ultrasonic Waves in Lubrication Monitoring:</b> Saeid Taghizadeh, University of Sheffield (UK)	<b>The Effect of Friction Modifier and Viscosity on Piston Rings/Cylinder Liner Friction in Floating Liner Single-Cylinder Engine Tests:</b> Abdullah Alenezi, University of Leeds (UK)		
<b>18:00</b>	End of the first day					

Wednesday, 26 January 2022

**P2 – Plenary Session** Chair: Prof. G. JACOBS, N. DÖRR

**09:00** **Vacuum Tribology of Superhard ta-C Coatings:** Dr. Volker Wehnacht, Fraunhofer IWS (GER)

**09:30** **Novel Nanocomposite with Ionic Liquid and Graphene for Electroconductive Radial Plain Bearings:** Susanne Beyer-Faiss, Dr. Tillwich Stehr GmbH (GER)

**10:00** **Tribology in the Age of Digitalization and Green Deal – Building Digital Services!:** Franz Pirker, AC2T research GmbH (AUT)

**10:30** **Break/Exhibition**

	<b>C1 – Lifetime Behaviour</b> (Trends Lubricants and Additives) T. RÜHLE	<b>C2 – Novel Lubricant/ Lubrication Concepts</b> (Trends Lubricants and Additives) Chair: N. DÖRR	<b>C3 – Tribometry</b> (Test Methodologies and Measurement Technologies) Chair: Prof. A. ALBERS	<b>C4 – Lubricant-Surface Interaction</b> (Coatings Surfaces and Underlying Mechanisms) Chair: Prof. C. GACHOT	<b>C5 – Digital Tribological Services: i-TRIBOMAT</b> Chair: Prof. MINAMI	<b>C6 – Simulation</b> (Digitisation in Tribology) Chair: C. PASTOR
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<b>11:00</b>	<b>Oil Nitration in a Large-Scale Device for Artificial Alteration:</b> Adam Agocs, AC2T research GmbH (GER)	<b>Tribology of Ionic Liquids &amp; Graphene – a Synergistic Combination:</b> Dr. Sebastian Plebst, Iolitec (GER)	<b>How to Reduce Time and Cost in Tribology Testing?:</b> Dr. Dirk Drees, Falex Tribology (BEL)	<b>Mechanisms of Tribo-Oxidation in High-Purity Copper:</b> Dr. Julia Rau, KIT (GER)	<b>Digitalization of Tribological Systems for Decision-Making:</b> Dr. Donna Dykeman, Ansys Granta (UK)	<b>Molecular Dynamics Simulation on the Behavior of Viscosity Modifying Polymers in Oil:</b> Shuhai Yamamoto, Mitsui Chemicals (JPN)
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<b>11:30</b>	<b>An Experimental Study of the Effect of Thermal Aging on the Lubrication Performance of EALs:</b> Dr. Mar Combarros, IQL Application Lab (ESP)	<b>Biomimetic Water Based Lubricant Development: Nanoencapsulation with Micelles and Liposomes:</b> Manoj Murali, Imperial College of London (UK)	<b>Investigation of Rolling and Lateral Slip on the MopeD Qs2Stg 500:</b> Knud-Ole Karlson, KTM, University of Applied Science Mannheim (GER)	<b>Humidity Influence on Graphite Lubrication:</b> Carina Morstein, KIT (GER)	<b>From Service Request to Standardized Tribological Data Sets:</b> Alvaro Garcia, Fundación TEKNIKER (ESP)	<b>Molecular Dynamics Study of the Adsorption of Organic Friction Modifiers on Iron Oxide Surfaces:</b> Stephan Mohr, Nextmol (ESP)
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<b>12:00</b>	<b>Enhanced Engine Lifetime by Use of Premium Fuel:</b> Marcella Frauscher, AC2T research GmbH (AUT)	<b>Reversible Viscosity Tuning Using UV Light:</b> Dr. Dominic Linsler, Fraunhofer IWM (GER)	<b>The Use of the MTM Rig for Wear Testing:</b> Matthew Smeeth, PCS Instruments (UK)	<b>Effect of Lubricants on Hydrogen Permeation under Rolling Contact of Steel:</b> Yoji Sunagawa, Idemitsu Kosan Co., Ltd. (JPN)	<b>Trusted Tribological Materials Characterisation Services:</b> Mirco Kröll, Bundesanstalt für Materialforschung und -prüfung (GER)	<b>Diversification of Evaluation Options for Tribological Measuring Results Using Origin and Phytos:</b> Thomas Witt, Dr. Tillwich Stehr GmbH (GER)
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**12:30** **Lunch Break/Exhibition**

	<b>D1 – Lifetime Behaviour</b> (Trends Lubricants and Additives) Chair: M. MATZKE	<b>D2 – Lubricants in Electric Vehicles</b> (Trends Lubricants and Additives) Chair: M. FRAUSCHER	<b>D3 – Tribometry</b> (Test Methodologies and Measurement Technologies) Chair: Prof. J. MOLTER	<b>D4 – Tribology Behavior</b> (Coatings Surfaces and Underlying Mechanisms) Chair: Dr. V. WEHNACHT	<b>D5 – Digital Tribological Services: i-TRIBOMAT</b> Chair: Prof. MINAMI	<b>D6 – Modelling</b> (Digitisation in Tribology) Chair: Prof. D. BARTEL
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<b>14:00</b>	<b>Influence of Mechanical, Thermal, Oxidative and Catalytic Processes on the Thickener Structure:</b> Dr. Markus Grebe, Hochschule Mannheim – Competence Center for Tribology (GER)	<b>Novel Defoamers for Use in Low Viscosity Electric Vehicle Fluids:</b> Noriko Ayame, ENEOS Corporation (JPN)	<b>Tribological Assessment of Marine Distillate Fuels under a variant HFRR Method:</b> Theodora Tyrovolas, National Technical University of Athens (GRE)	<b>Tribological and Microstructural Analysis of PVD Coatings: Deposited on High Chromium Steel Substrates for Cold Rolling Applications:</b> Antonio Carabillò, University of Udine (ITA)	<b>Upscaling Materials Performance:</b> Dr.-Ing. Ulrike Cihak-Bayr, AC2T research GmbH (AUT)	<b>Designing a REACH Conform Small Conrad Bearing of a Plunger Pump with the Help of EHD Simulation:</b> Vincent Hoffmann, Tribo Technologies GmbH (GER)
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Continuation Wednesday						
14:30	<b>The Unexpected Behaviour of Synthetic Esters as Cobase Stocks on Resistance to Oxidation:</b> Siegfried Lucazeau, NYCO (FRA)	<b>Test Method to Determine Improvements of E-Drive Efficiency:</b> Michael Schulz, ISP Salzbergen GmbH & Co. KG (GER)	<b>Innovative Design of Electrical Lubricants Test-Rig for E-Grease and E-Fluids:</b> Deepak H. Veeragowda, Ducom Instruments Europe B.V. (NED)	<b>Nanoscale Wear Behavior of CVD Grown Monolayer WS2:</b> Himanshu Rai, Indian Institute of Technology Delhi (IND)	<b>Friction Control by Surface Texturing in Internal Combustion Engines:</b> Dr. Konstantinos Gkagkas, Toyota Motor Europe NV/SA (BEL)	<b>Predicting Electric Vehicle Transmission Efficiency Using a Thermally Coupled Lubrication Model:</b> Joseph Shore, Imperial College London (UK)
15:00	<b>Next Generation Anti-Wear Development:</b> Christelle Chretien, Solvay Novecare – Industrial Process Solutions (USA)	<b>A Novel Class of Bio-based Organic Friction Modifiers Revealing the Superlubricity Effect:</b> Prof. Boris Zhmud, Bizol Lubricants (GER)	<b>Conductive Layer Deposits and the Development of Bench Test Technology for Electric Vehicle Drivetrains:</b> Greg Miiller, Savant Group (USA)	<b>Tribological Behaviour of the TMD Coated Ceramics in the Vacuum Environment:</b> Dr. Kosta Simonic, Czech Technical University Prague (CZE)	<b>Novel Journal Bearing Materials for Wind Turbine Gearboxes:</b> Taneli Rantala, Moventas Gears (FIN)	<b>Polymer-Coated Plain Bearings During Start-Stop Operation – an Experimental and Numerical Assessment:</b> Florian König, RWTH Aachen University (GER)
15:30	Break/Exhibition					
	<b>E1 – Greases</b> (Trends Lubricants and Additives) Chair: M. DIENWIEBEL	<b>E2 – Lubricants in Electric Vehicles</b> (Trends Lubricants and Additives) Chair: M. FRAUSCHER	<b>E3 – Lubricant Analysis</b> (Test Methodologies and Measurement Technologies) Chair: Prof. J. MOLTER	<b>E4 – Electric Impact</b> (Automotive and Transport Industry) Chair: J. MÜLLERS	<b>E5 – Sustainable Lubrication</b> Chair: M. MATZKE	<b>E6 – Sliding Contact</b> (Digitisation in Tribology) Chair: Dr. M. GLESS
16:00	<b>Polyglycols as High Performant Base Oil Components in Modern Greases:</b> Dr. Cristina Schitco, Clariant (GER)	<b>Improving Gear and Thermal Efficiency of Electric Vehicle Fluids Using Group V Base Stocks:</b> Dr. Gareth Moody, Croda (UK)	<b>Improved Oil Condition Monitoring of Industrial Lubricating Oils:</b> Rüdiger Krethe, OilDoc GmbH (GER)	<b>Mounting Positions of Electrical Connectors and the Wear of Coatings under Vibration Loads:</b> Kevin Krüger, Ostwestfalen-Lippe University (GER)	<b>Sustainability by Design Criteria using Tribology and Lifecycle Assessment:</b> Dr. Amaya Igartua, Fundación TEKNIKER (ESP)	<b>An Experimental Study and Numerical Modelling of Nanocomposite Coating Wear in Sliding Contact:</b> Prof. Zulfiqar Khan, Bournemouth University (UK)
16:30	<b>Less could be More, when Formulating High-Performance Greases:</b> Mehdi Fathi-Najafi, Nynas AB (SWE)	<b>Polymeric Additives as an Important Ingredient in E-drive Fluids:</b> Dr. Dimity Shakhvorostov, Evonik Operations GmbH (GER)	<b>Study of Capacity of Spectroscopy UV – Vis &amp; NIR to Quantify Fuel Dilution on Used Oil:</b> Prof. Bernado Tormos, Universitat Politècnica de Valencia (ESP)	<b>A fast Piston-Ring/ Cylinder-Liner Friction Prediction Based on a Semi-Analytical Hydrodynamic Model and Real Measured Surface Topography:</b> Thomas Lubrecht, IREIS (FRA)	<b>Assessment of Biobased Lubricants Compatibility with Metals:</b> Dr.-Eng. Georg S. Dodos, ELDON'S S.A. (GRE)	<b>Effect of Thermal Conductivity of Bearing on the Thermal Wedge in Parallel Slider Bearing:</b> Prof. Tae-Jo Park, Gyeongsang Nation University (KOR)
17:00	<b>Novel Basestock Technology for EV Bearing Grease Applications:</b> Sven Meinhardt, Exxon-Mobil Chemical Central Europe (GER)	<b>Enhanced Gear Lubricity for Lubricant Oils Applied to Transaxles in HEVs and EVs:</b> Dr. Keiichi Narita, Idemitsu Kosan Co.,Ltd. (JPN)	<b>On the role of Microorganisms for Lubricants – Sometimes good, Sometimes bad:</b> Dr. Peter Lohmann, Hermann Bantleon GmbH (GER)	<b>Thermal Expansion Influence on the Scuffing Initiation in a Piston Ring Cylinder Liner</b> <b>Contact:</b> Simona Dahdah, INSA-Lyon (FRA)	<b>Addressing Sustainability Needs of the Lubricants Industry:</b> Dr. Sabrina Stark, BASF SE (GER)	<b>Slender EHL Contacts Under High Sliding Conditions:</b> Marko Tošić, Technical University of Munich (GER)
17:30	<b>Calcium Sulfonate Greases – Improving Biodegradable Solution Thanks to 1-Step Process:</b> Guillaume Notheaux, SEQENS (FRA)	<b>Improved Energy Efficiency and Thermal Management in EVs Using Novel Synthetic Base Stocks:</b> Dr. Babak Lotfi, ExxonMobil (USA)	<b>Studying the Action of Surface Active Lubricant Additives by Surface Analytical Methods:</b> Dr. Thomas Rühle, BASF SE (GER)		<b>Novel, Bio-based Group V Basestocks for EV: Customizable Performance with Reduced CO2 Footprint:</b> Arthur Coen, Oleon NV (NED)	<b>Opportunities and Applications for Artificial Intelligence in Sealing Technology:</b> Dr.-Ing. Matthias Baumann, Universität Stuttgart (GER)
18:00	End of the second day					

Thursday, 27 January 2022						
	<b>F1 – Friction Modification / Efficiency</b> (Trends Lubricants and Additives) Chair: Prof. G. JACOBS	<b>F2 – Novel Lubricant / Lubrication Concepts</b> (Trends Lubricants and Additives) Chair: N. DÖRR	<b>F3 – Tribometry</b> (Test Methodologies and Measurement Technologies) Chair: Dr. M. GLESS	<b>F4 – Surface Reactions</b> (Coatings Surfaces and Underlying Mechanisms) Chair: M. DIENWIEBEL	<b>F5 – Sustainable Lubrication</b> Chair: M. MATZKE	<b>F6 – Soft Contacts</b> (Digitisation in Tribology) Chair: F. KÖNIG
<b>09:00</b>	<b>Longer Lifetime of Wind Turbine Bearings and Gears Using Phyllosilicate-Additives:</b> Stefan Bill, Rewitec GmbH (GER)	<b>Alternative Lubricants in Wind Turbines to Avoid WEC Formation:</b> Dr. Dominik Kürten, Fraunhofer IWM (GER)	<b>Tribological Simulation of Friction Torque Test Using SRV and EHD Tribometer:</b> Rajendra Mahapatra, Indian Oil Corporation Ltd. (IND)	<b>Topography Changes During Pre-Conditioning:</b> Rüdiger Fehrenbacher, IPEK, KIT (GER)	<b>Sustainable Grease Production: Optimizing Energy Efficiency and Carbon Intensity:</b> Dr. Eng. Georg S. Dodos, ELDON'S S.A. (GRE)	<b>Improved Design Process of Dry-Running Plastic Radial Plain Bearings:</b> Marc Fickert, Institut für Verbundwerkstoffe GmbH (GER)
<b>09:30</b>	<b>Low Friction with Polymer Friction Modifier: a Combined Tribology and Physico-Chemical Approach:</b> Dr. Frederic Dubreuil, Ecole Centrale de Lyon (FRA)	<b>Formation of WEC Under Sliding, Mixed Friction and Current Passage Using Lubricant Compositions:</b> Daniel Cornel, MSE, RWTH Aachen (GER)	<b>In-situ Measurement of ICE Journal Bearing Lubricant Film Thicknesses:</b> Henry Brunskill, Peak to Peak Measurement Solutions Ltd. (UK)	<b>Improving the Tribological and NHV Behavior of Gears:</b> Prof. Boris Zhmud, Applied Nano Surfaces Sweden AB (SWE)	<b>CO<sub>2</sub>ZERO – How Lubricants Contribute To Climate Neutrality:</b> Apurva Gosalia, Senate of Economy, Berlin (GER)	<b>The Lubrication of Soft Rough Interactions Unraveled by Lattice Boltzmann Simulation:</b> Dr. Rajat Srivastava, Università del Salento (ITA)
<b>10:00</b>	<b>New Generation of Nanolubricants Fuel Economy:</b> Marta Hernaiz, TEKNIKER (ESP)		<b>Investigations of the Ball Motion Behaviour in Spindle Bearings under Dynamic Loads:</b> Hans-Martin Eckel, WZL, RWTH Aachen (GER)	<b>Influence of Black Oxide Coating on Micropitting and ZDDP Tribofilm Formation:</b> Mao Ueda, Shell Lubricants Japan K.K. (JPN)		<b>Tribological Behavior Study of Elastomer - Hard Substrate Contact in Marine Environment:</b> Ahmad Al-Khatib, ECAM Rennes (FRA)
<b>10:30</b>	<b>Break/Exhibition</b>					
	<b>G1 – Friction Modification / Efficiency</b> (Trends Lubricants and Additives) Chair: Dr. A. FATEMI	<b>G2 – Novel Lubricant / Lubrication Concepts</b> (Trends Lubricants and Additives) Chair: G. GAULE	<b>G3 – Metrology in Tribology – Wear</b> (Test Methodologies and Measurement Technologies) Chair: Prof. J. MOLTER	<b>G4 – Oxidation &amp; Wear</b> (Coatings Surfaces and Underlying Mechanisms) Chair: Dr. U. CIHAK-BAYR	<b>G5 – Sustainable Lubrication</b> Chair: M. MATZKE	<b>G6 – Friction</b> (Automotive and Transport Industry) Chair: A. PAUSCHITZ
<b>11:00</b>	<b>A Study on Axle Lubricant Composition Impact on Efficiency Using Light Duty Truck Drive Axle:</b> Arjun Goyal, BASF Corporation (USA)	<b>Novel Transmission Lubricants for New Generation Vehicles:</b> Dr. Ratnadeep Joshi, Indian Oil Corporation Ltd. (IND)	<b>Continuous Wear Measurements of Diamond-like Carbon (DLC) Based on Radioactive Isotopes:</b> Manuel Zellhofer, AC2T research GmbH (AUS)	<b>Physical and Numerical Investigation of the Friction Behavior of Graphite Lubricated Axial Ball Bearings:</b> Arn Joerger, KIT (GER)		<b>Design, Reliability and Service Life Predictions of Tribological Contacts in Drive Systems:</b> Dr.-Ing. Michael Gless, Contact-Engineering.de (GER)
<b>11:30</b>	<b>New Fuel Efficient, Shear Stable Axle Lubricant to meet new US Green House Gas Requirements:</b> Arjun Goyal, BASF Corporation (USA)	<b>Improvement of Tribological Performances of MoDTC Induced by Methylene-Bis(dithiocarbamate) in Engine Lubricants:</b> Yu Min Kiw,University of Strasbourg (FRA)	<b>Quantifying Wet Brake Chatter Using Accelerometers:</b> Michael Botkin, Southwest Research Institute (USA)	<b>Wear of Electrical Contacts of Equal Motion Amplitude and Equal Force in Different Directions:</b> Dirk Hilmert, Ostwestfalen-Lippe University (GER)		<b>Influence of the Rotation Direction of the Cam on the Friction Losses of a Cam/Finger Follower Contact:</b> Jonny Dufils, IREIS (FRA)



Continuation Thursday					
12:00	<b>Understanding the Friction and Wear Behavior of In-service Lubricants:</b> Dr. Deepak Veeregowda, Ducom Instruments Europe B.V. (NED)	<b>Theoretical and Computational Estimation of the Value of the Coefficient of Friction of the Synovial Fluid of Human Joints:</b> Prof. Sergey Fedorov, Kaliningrad State Technical University (RUS)	<b>Identification of an Adequate Stressing Level for Running-In of a Lubricated DLC-Metal-System:</b> Joachim Faller, Fraunhofer Institute for Mechanics of Materials IWM (GER)	<b>Improving Abrasive Wear Performance of Polymers:</b> Dr. Helena Ronkainen, VTT Technical Research Centre of Finland (FIN)	<b>Wet Friction Material and Fluid Screening on Benchtop Rig:</b> Carlos Sanchez, Southwest Research Institute (USA)
12:30	Lunch Break/Exhibition				
	<b>P3 – Concluding Plenary Session</b> Chair: Dr. A. PAUSCHITZ, Dr. K. TOPOLOVEC-MIKLOZIC				
14:00	<b>Base Oil Benchmarking for Gear Oils in Electric Vehicle Drivetrains:</b> Dr. Steffen Glänzer, Clariant (GER)				
14:30	<b>From Emerging Trends to Current Lubrication Challenges: STLE’s View:</b> Dr. Ken Hope, Chevron Phillips Chemical Company (USA), STLE President 2021-2022				
15:00	<b>An Innovative Approach to Reduce Friction in Transport from Hydrodynamics to Boundary Regime:</b> Prof. Denis Mazuyer, Ecole Centrale de Lyon (FRA)				
15:30	End of the event				

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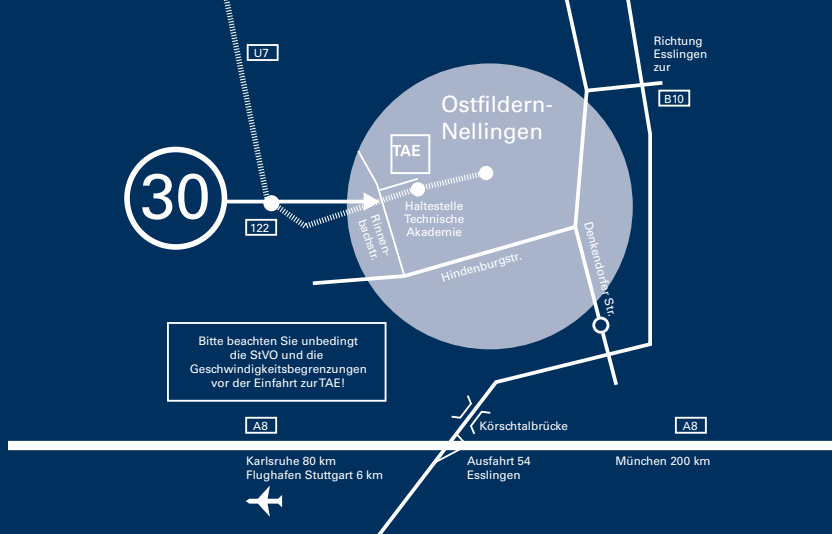


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### BY PLANE

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