

# WTC 2026

World Tribology Congress

## PROGRAM BOOK

### Organizers



BRAZILIAN MATERIALS  
RESEARCH SOCIETY



### Endorser



### Support



# Summary

Programme Book contents at a glance.

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# Welcome Addresses

## Welcome from the International Tribology Council



### To the attendees of the VIII World Tribology Congress, 2026, Rio de Janeiro, Brazil

Dear Friends and Colleagues:

It is with great pleasure that, in the name of the ITC and its Executive Committee, I welcome you to the 8th World Tribology Congress in Rio de Janeiro, Brazil, the Cidade Maravilhosa (marvelous city)!

In the coming days, you will experience the warm welcome of our Brazilian colleagues and the wonders of this vibrant location, while you have the chance to learn of the latest breakthroughs and developments from the worldwide tribology community. The ITC, whose roles include the selection of the WTC organizing society every four years, exists to facilitate communication between tribologists worldwide. This conference is indeed a wonderful opportunity to forge connections between tribologists from every corner of the globe and at every stage of their careers.

This WTC happens in a period of uncertainty: geopolitical and climatic. While we, as tribologists, can only hope that elected politicians can solve the former, we can contribute significantly to the latter. Whether it be in the design of better lubricants to aid in the reduction of CO2 emissions and energy consumption, or the development of better tribological systems to improve the reliability of wind turbines, tribologists can play a very significant role in helping meet net-zero goals - a focus area of this WTC.

Despite our importance in solving some of these vital issues, our role as tribologists is often "below the radar". We have a responsibility to educate not only the public as to the criticality of tribology, but also to enlighten a significant number of engineers (especially non-mechanical engineers) as to the significance of our field. Tribology should form a part of all engineering curricula, and high-school teachers should incorporate tribological projects into their school programs. Tribology societies have a responsibility to spearhead such activities in their communities.

In the name of our community, I would like to thank the Organisers for their years of hard work, and I hope you find enrichment from the many presentations at the exciting conference that they have planned. Please enjoy WTC 2026 and the coming days of intellectual stimulation in fascinating surroundings.

Sincerely,

A handwritten signature in black ink, appearing to read 'N. Spencer'.

Nicholas D. Spencer  
President, International Tribology Council

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International Tribology Council  
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8600 Dübendorf, Switzerland  
[www.itctribology.net](http://www.itctribology.net)  
September 18, 2026

# Welcome to WTC 2026!



We are thrilled to greet you at the 8th World Tribology Congress (WTC 2026).

Building on the legacy of past congresses in London (1997), Vienna (2001), Washington, DC (2005), Kyoto (2009), Torino (2013), Beijing (2017), and Lyon (2022), WTC 2026 marks a historic milestone as the first edition held south of the Equator, in the vibrant city of Rio de Janeiro, Brazil.

WTC 2026 unites an exceptional global community of academic and industry leaders. Reflecting WTC's international prestige, diversity, and commitment to excellence, the congress received 1,002 submissions from 2,330 authors across 51 countries. After a rigorous peer-review process, 910 high-quality contributions were accepted for presentation.

Our comprehensive technical program includes 14 thematic tracks, with a dedicated partnership track with the STLE (Society of Tribologists and Lubrication Engineers). We place special emphasis on the Young Tribologists Forum, offering a platform for early-career researchers to shape the future of tribology.

The scientific program underscores the depth and impact of tribological research, addressing urgent challenges such as carbon footprint reduction, sustainability, and the global energy transition.

**Program highlights include:**

- 6 Plenary talks delivered by leading international figures;
- 4 Peter Jost Award Recipients with outstanding achievements in the field;
- 20 Keynote Lectures and 30 Invited Talks covering cutting-edge topics;
- 2 Round Table Discussions delving into Research, Innovation and Industrial Impact - International Cooperation University - Industry and Roundtable Mentoring - Young Tribologists;
- 166 Technical Oral Sessions alongside 6 Poster Sessions showcasing state-of-the-art developments.

Beyond the scientific sessions and extensive technical exhibition, WTC 2026 promises an unforgettable experience in Rio de Janeiro. The Windsor Convention & Expo Centre in Barra da Tijuca - steps from the beach and the 2016 Olympic Games site - offers modern, world-class conference facilities infused with Brazil's unique charm and warmth. Renowned for its pristine beaches and vibrant cultural and leisure opportunities, Barra provides the perfect backdrop for networking, fostering international collaborations, and creating lasting memories.

We look forward to welcoming you to an inspiring and impactful congress in Rio de Janeiro, with long-lasting impact for the world's Tribology and sustainability!

**The VIII World Tribology Congress Organising Committee**

# Committees and Organisers

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- |                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                           |
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# General Information

Practical information for your arrival and stay in Rio de Janeiro.

## Arriving in Brazil

Brazil has numerous airports offering direct flights to and from major international destinations. The primary hubs for entering the country are Rio de Janeiro International Airport - Galeao (GIG), Sao Paulo International Airport - Guarulhos (GRU), and Campinas-Viracopos International Airport (VCP). Both Sao Paulo and Campinas offer several daily connections to Rio de Janeiro.

### GIG

#### Rio de Janeiro - Galeao

Primary international gateway in Rio de Janeiro. Approximately 38 km from the Windsor Oceanico Convention Centre.

### GRU

#### Sao Paulo - Guarulhos

Brazil's largest international hub, with frequent connections to Rio de Janeiro.

### VCP

#### Campinas - Viracopos

International airport serving Campinas and Sao Paulo state, with daily connections to Rio.

## Connecting through Sao Paulo?

If your international flight arrives at GRU, check the departure airport of your Rio connection carefully. Flights may depart from GRU or from Congonhas (CGH), which requires a ground transfer across Sao Paulo and can take considerable time in traffic.

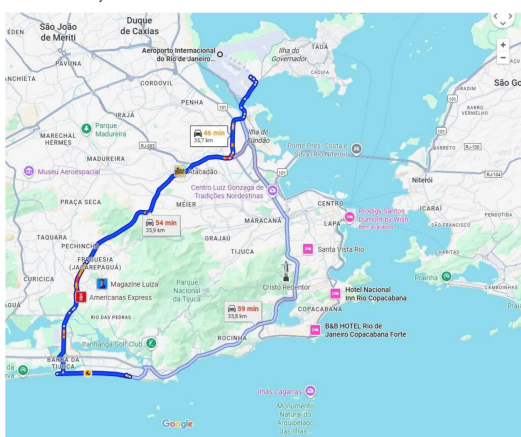


Image Source: Google Maps  
Image source: Google Maps

## Galeao (GIG) to Windsor Oceanico Convention Centre

Typical transfer time: 35-70 minutes, depending on route, traffic conditions and time of day.

Official yellow taxis, special airport taxi services and app-based rides are readily available at the airport.

# Airports in Rio de Janeiro

Two airports serve Rio de Janeiro, each with different advantages for congress participants.

## Galeao International Airport (GIG)

Galeao is approximately 38 km from the convention centre. Transfer times generally range from 35 to 70 minutes. There is no direct metro or train connection from the airport.

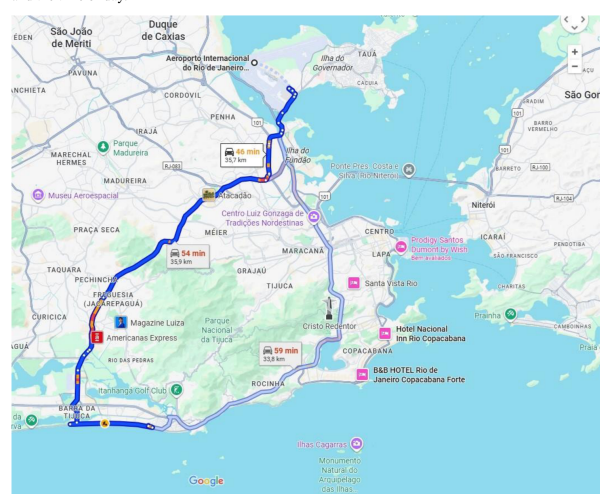


Image Source: Google Maps

Image source: Google Maps

## Santos Dumont Airport (SDU)

Located in downtown Rio, Santos Dumont primarily operates domestic flights. Transfer time to the convention centre is typically 35 to 70 minutes, depending on traffic. The VLT light rail provides convenient connections to several metro stations.

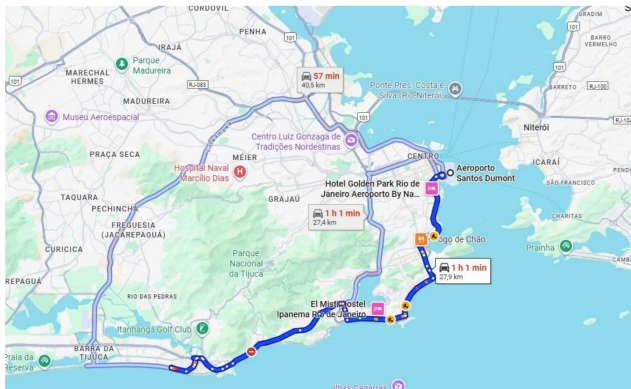


Image Source: Google Maps

Image source: Google Maps

## Connection tip

If you arrive in Brazil through GRU, a connecting flight to SDU can be a convenient alternative to GIG. Always confirm that your onward flight departs from the same Sao Paulo airport.

# Getting Around Rio de Janeiro

Practical transportation options between the airports, downtown Rio and Barra da Tijuca.

## Official taxis

Official yellow taxis and special taxi companies operate at the airports. Pre-paid fares are recommended when available.

## Uber

Uber is widely used. For airport transfers, Uber Comfort or Black are recommended. Follow the designated pick-up signs at GIG.

## Public transport

Public transport is available, but convenience varies. With luggage, private transport is generally the simpler option.

## VLT connections

Santos Dumont Airport connects easily to the VLT light rail, which links with central Rio and several metro stations.

## Terminal Gentileza

Rio de Janeiro's multimodal transportation hub, Terminal Gentileza, is connected to Galeao International Airport by an express bus service. The terminal integrates with the VLT light rail, enabling connections towards Santos Dumont Airport and several metro stations.

The route passes near attractions such as the Museum of Tomorrow, AquaRio and the Rio Art Museum (MAR). It can be an interesting sightseeing route, although it may take longer than a direct taxi or ride-hailing transfer.

# Recommended Transfer Options

Indicative travel options to and from the Windsor Oceanico Convention Centre.

## Official Airport Taxi

GIG - Convention Centre: approx. USD 32  
SDU - Convention Centre: approx. USD 26

Suitable for up to 3 people, depending on luggage size. Pre-paid airport taxi fares are recommended.

## Booked Transfer

Partner agency: Follow Up Tours and Events  
Sedan: USD 66 - up to 3 people with small luggage.  
Van: USD 215 - up to 9 people with small luggage.

Rates are one-way between airport and hotel.

## Uber

Recommended categories: Comfort or Black  
Estimated cost: USD 27-34

Prices vary with vehicle category, demand and traffic. Capacity depends on luggage size.

## Public Transportation

GIG - Convention Centre  
Estimated total cost: USD 8.74-28.24  
Estimated travel time: 54 min-1 h 34 min+

Recommended only when you have enough time and are travelling without significant luggage.

## Taxi and tipping

Tipping is not required for taxis or Uber in Rio de Janeiro. If you choose to tip, it is generally no more than 10%. Taxis may charge an official additional fee for luggage.

Booking link supplied for Follow Up Tours and Events:

<https://www.net-expert.com/followuptour/Evento/wtc2026>

## Where to Eat and Shop

A selection of convenient options in Barra da Tijuca, close to the congress venue.

### Picanha & Etc

Steak, seafood, chicken, pasta and risottos.

### Fratelli

Italian restaurant serving pasta, risottos, meat and seafood.

### Tourao

Traditional Brazilian churrascaria and classic barbecue experience.

### Paris 6

French-inspired restaurant within easy reach of the convention centre.

### Brou

Casual dining option a short distance from the venue.

### Bangalo Bar e Restaurante

Seafood-focused restaurant near the convention centre.

### Conversa Fiada

Brazilian-style bar and restaurant within walking distance.

### San Blas

Seafood restaurant located a short distance from the venue.

## Shopping

### Downtown Shopping

Open-air shopping centre with restaurants, shops and services.

### Rio Design Barra

Shopping centre with a broad selection of restaurants, stores and services. Rush-hour travel times may be longer.

# Safety Guide

Simple precautions can help make your stay in Rio de Janeiro safer and more comfortable.

## Emergency Numbers

|                           |            |            |              |
|---------------------------|------------|------------|--------------|
| Tourist Police (DEAT)     | Police     | Ambulance  | Fire Brigade |
| <b>+55 (21) 2332-2924</b> | <b>190</b> | <b>192</b> | <b>193</b>   |

## Identity & Documentation

Keep your original passport secured in your hotel safe when it is not required. Keep a digital copy on your phone and a printed copy available for everyday reference.

## Airport Arrivals & City Travel

Use official airport taxi counters, verified transportation services or pre-booked private transfers. Whenever possible, use registered taxis or app-based services where the driver and journey can be tracked.

## Public Transport & Navigation

Private transportation is generally more convenient with luggage. When using public transport, keep personal belongings close. Navigation apps may suggest unfamiliar residential routes; prefer major roads when possible.

## Personal Belongings

Avoid displaying expensive watches, jewellery or large amounts of cash. Be discreet when using your phone in busy public spaces and never leave bags or electronics unattended on the beach.

## Beach & ATM Awareness

Beaches and shorelines are less advisable late at night, particularly in quiet or poorly lit areas. Prefer ATMs inside bank branches, shopping centres or other controlled indoor locations.

# Plenary Speakers

Biographies and plenary lecture abstracts from the official WTC 2026 speaker material.



## Ali Erdemir

Texas A&M University, USA

PLENARY SPEAKER

### LECTURE

## Enabling the Electric Vehicle Revolution: Overcoming Materials and Tribological Challenges for a Green and Sustainable Transportation Future

### Biography

Ali Erdemir is a Distinguished Professor and Halliburton Chair in the Mechanical Engineering Department of Texas A&M University, College Station, Texas, USA. In recognition of his research accomplishments, Dr. Erdemir has received numerous coveted awards and honors including being elected as a member of the National Academy of Engineering, the European Academy of Sciences, the European Academy of Sciences and Arts, the World Academy of Ceramics, The Science Academy of Turkey (2021). He is also an elected Fellow of the National Academy of Inventors. He was the President of the International Tribology Council from 2017 to 2022 and STLE from 2016 to 2017. Dr. Erdemir is also an Honorary Member of ASME and STLE; as well as a Fellow of AAAS, ASME, STLE, AVS, and ASM-International. He is the recipient of 37 U.S. patents and has authored/co-authored more than 350 research articles (250 of which are peer-reviewed journal articles), co-edited five books, presented more than 250 invited/keynote/plenary talks at national/international conferences. His current research focuses on bridging scientific principles with engineering innovations towards the development of new materials, coatings, and lubricants for a broad range of industrial applications in manufacturing, transportation, and other energy conversion and utilization systems.

### Abstract

Ali Erdemir  
Distinguished Professor and Halliburton Chair  
J. Mike Walker '66 Department of Mechanical Engineering  
Texas A&M; University  
College Station, TX, USA

The global efforts for a sustainable transportation future have pushed electric vehicles (EVs) to the forefront of technological innovations, promising a green, reliable, and economically viable mobility for humanity [1]. However, rapid transition from century-old combustion engine-based technology hinges on overcoming many critical materials and tribological challenges. Specifically, EV drivetrains operate under significantly higher torque, load, speed, and temperature conditions than internal combustion engine vehicles [2]. The situation is further exacerbated by the risk of frequent electrical discharges at tribological interfaces that call for far more advanced materials and lubrication solutions. In particular, the shift to a torque-centric drivetrain operation, coupled with extreme contact pressures and shear forces, accelerates wear, fatigue, and scuffing, threatening long-term reliability of EVs. Overall, EVs' thermal, electrical, and tribological phenomena are deeply intertwined, demanding a holistic and combinatorial approach. This plenary address will provide a comprehensive overview of these interdisciplinary issues, emphasizing the pivotal role of advanced materials, innovative coatings, and next-generation lubrication technologies that can ensure efficiency, reliability, and thus sustainability of future EVs.

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[2] "Electric Vehicle Tribology: Challenges and Opportunities for a Sustainable Transportation Future", Editors: Leonardo Farfan-Cabrera and Ali Erdemir, Elsevier, Amsterdam, 2024, ISBN: 9780443140747



## Bharat Bhushan

Academy Professor, USA

PLENARY SPEAKER

### LECTURE

## Lessons from Nature: Bioinspired Mechanically Durable and Self-healing Superliquiphilic/phobic Surfaces for Green Tribology

### Biography

Dr. Bharat Bhushan is an Academy Professor (San Jose, CA), and has served as an Ohio Eminent Scholar and The Howard D. Winbiger Professor in the College of Engineering, the Director of the Nanoprobe Laboratory for Bio- & Nanotechnology and Biomimetics (NLB2) and affiliated faculty in John Glenn College of Public Affairs at the Ohio State University, Columbus, Ohio. In 2013-14, he served as ASME/AAAS Science & Technology Policy Fellow, House Committee on Science, Space & Technology, United States Congress, Washington, DC. He has served as Expert Investigator on IP related issues in the U.S. and International Courts. He holds B. S., two M.S., a Ph.D. in mechanical engineering/mechanics, an MBA, and five honorary doctorates, a total of 10 College degrees. His research interests include Fundamental studies in the interdisciplinary areas of Bio/nanotribology/nanomechanics, Nanomaterials Characterization, Scanning Probe Techniques, Magnetic Storage, Bio/nanotechnology, Nanomanufacturing, Bioinspired Liquid Repellency, Self-cleaning, Anti-icing, Anti-fouling, and Water Harvesting, Science and Technology Policy. He is an internationally recognized expert of bio/nanotribology and bio/nanomechanics using scanning probe microscopy, and biomimetics. He is considered by some one of the pioneers of tribology and mechanics of magnetic storage devices, nanotribology, green tribology, and biomimetics. He had introduced the word nanotribology in the title of a Nature paper in 1995 and in the title of a first book on green tribology in 2010. He is one of the most prolific authors. He has authored 11 scientific books, 100+ handbook chapters, and 900+ scientific papers. He is Google Scholar's one of 1248 Highly Cited Researchers in All Fields, h-index - 147+ with 110 k+ citations; Scopus's one of 401 Scientists for Career-long Citation Impact Across All Fields out of over 8 million scientists from around world; 4th Highly Cited Researcher in Mechanical Eng.; 149th Most Cited in Materials Science in the World; and ISI Highly Cited Researcher in Materials Science and in Cross-field Category. His research was listed as one of the Top Ten Science Stories of 2015. He holds more than 25 U.S. and foreign patents. He has given more than 400 invited presentations including 300+ keynote/plenary addresses at major international conferences on six continents. He delivered a TEDx 2019 lecture. He is the recipient of numerous prestigious awards and international fellowships including the Alexander von Humboldt Research Prize for Senior Scientists, Max Planck Foundation Research Award for Outstanding Foreign Scientists, Fulbright Senior Scholar Award, International Tribology Gold Medal, Institution of Chemical Engineers (UK) Global Award, and NASA's Certificate of Appreciation to recognize the critical tasks performed in support of President Reagan's Commission investigating the Space Shuttle Challenger Accident. He has organized various international conferences and workshops. He is a member of various professional societies, including the International Academy of Engineering (Russia). He has previously worked for various industrial research labs including Mechanical Technology Inc., SKF, and IBM Almaden Research Center, San Jose, CA. He has held visiting professorship at University of California at Berkeley, University of Cambridge, UK, Vienna University of Technology, Austria, University of Paris, Orsay, ETH Zurich, EPFL Lausanne, Univ. of Southampton, UK, Univ. of Kragujevac, Serbia, Tsinghua Univ., China, Harbin Inst., China, Indian Institute of Science, Bengaluru, BITS Pilani and Hyderabad, and KFUPM, Saudi Arabia. LinkedIn

### Abstract

*Bharat Bhushan*

*Academy Professor, The Ohio State University (San Jose, CA)*

*Bhushan100@outlook.com*

Living nature, through some 3 billion years of evolution, has developed materials, objects, and processes that function from the nanoscale to the macroscale. The understanding of the functions provided by species and processes found in living nature can guide us to design and produce bioinspired surfaces for various applications<sup>1,2,3</sup>. There are a large number of flora and fauna with properties of commercial interest. Nature provides many examples of surfaces that repel (hydrophobic) or attract (hydrophilic) water. The most famous is the lotus leaf. Its surface contains a hierarchical structure that, combined with specific surface chemistry, results in a water repellant surface that is self-cleaning, as water droplets collect contaminants as they roll off. Some plant leaves, such as fagus leaves, are hydrophilic, allowing water to rapidly spread into a thin layer, increasing evaporation, leading to a dry and self-cleaning surface. By taking inspiration from nature, it is possible to create hierarchically structured surfaces with re-entrant geometry and surface chemistry that provide multifunctional properties including superliquiphilicity/phobicity, self-cleaning/low biofouling, and/or low drag. A facile, substrate-independent, multilayered nanoparticle/binder composite coating technique has been developed to produce various combinations of water and oil repellency and affinity with self-cleaning properties<sup>1,2,4</sup>. These coatings having a so-called re-entrant geometry can also repel surfactant-containing liquids. Some of the nanostructured surfaces have been found to be anti-bacterial<sup>1,2</sup>.



These coatings provide the basis to fabricate surfaces for a range of applications including self-cleaning, anti-fouling, anti-smudge, optical transparency, anti-fogging, anti-icing, low drag, water purification, and oil-water separation<sup>1-7</sup>. The coatings have been found to be mechanically durable and self-healing<sup>1,2</sup>.

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2Bhushan, B., *Introduction to Biomimetics and Bioinspiration: Materials and Surfaces for Green Science and Technology*, Springer (2024).

3Nosonovsky, M. and Bhushan, B., *Multiscale Dissipative Mechanisms and Hierarchical Surfaces: Friction, Superhydrophobicity, and Biomimetics*, Springer (2008).

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7TED Talk - Lessons from Nature: Bioinspired Surfaces for Green Tech, 2019



## Henara Lilian Costa

Federal University of Rio Grande, Brazil

PLENARY SPEAKER

### LECTURE

## Tribology and Energy Transition: a Brazilian Perspective

### Biography

She obtained her PhD from Cambridge University, UK. She has worked with tribology for over 30 years, with a main focus on reducing friction losses using surface modification and coatings or lubrication. She has authored around 200 manuscripts in journals, book chapters and conference proceedings. She is the editor-in-chief for *Surface Topography: Metrology and Properties*, a member of IFToMM and the Brazilian representative at IEA/AMT. Henara Costa is a Full Professor at the Federal University of Rio Grande, Brazil, where she is the head of the Surface Engineering Group. She has authored around 250 manuscripts in journals, books and conference proceedings. She holds a degree in Mechanical Engineering from the Federal University of Uberlândia (1992), a master's degree in Mechanical Engineering from the Federal University of Uberlândia (1995), a PhD in Engineering from the University of Cambridge (2005). She was a visiting scholar at Imperial College London (2013 and 2025) and a professor at the Laboratory of Tribology and Materials at the Federal University of Uberlândia from 1993 to 2016. She was editor-in-chief of the journal "Surface Topography: Metrology and Properties" from 2022 to 2025, where she remains in the editorial board. She is the coordinator of the National Institute of Science and Technology (INCT) in Green Tribology and Energy Transition (CT-Trib). The Brazilian Ministry of Mines and Energy officially appointed Henara Costa to represent Brazil at the IEA/AMT (International Energy Agency/Agreement on Advanced Materials for Transportation). She is a member of the Technical Committee on Tribology of the journal *International Federation for the Promotion of Mechanisms and Machines Science (IFToMM)*. Currently she is an associate editor of the "Journal of the Brazilian Society of Mechanical Sciences and Engineering" and is part of the editorial committee of various journals in the area of Tribology.

### Abstract

Henara Lillian Costa (1,2)

(1) Universidade Federal do Rio Grande, Rio Grande, RS, Brazil

(2) National Research Institute on Green Tribology for the Energy Transition (CT-Trib), CNPq, Brazil

In transport, the role of low carbon fuels is fundamental to bridging the current situation towards a clean and sustainable future. In passenger cars, the use of renewable ethanol fuel reduces gas emissions and pollution particulates. In Brazil, bioethanol fuel is key in the mobility sector, where the cars can run at any proportion of ethanol/gasoline (up to E100). Ethanol production also contributes for electric energy generation in Brazil; in the state of Sao Paulo 30% of the electric energy comes as a by-product from the ethanol production. Ethanol can also produce green hydrogen, which has been

explored in three main routes in the mobility sector: i. hydrogen ICEs to substitute diesel, ii. fuel cells by green hydrogen from ethanol reformation, and iii. fuel cells from on-board ethanol reformation, bypassing the challenges associated with hydrogen storage and distribution. Another low-carbon fuel explored in the talk is syngas produced from waste. Some of the research results will focus on the tribological aspects regarding the use of ethanol fuel and how it affects the main lubricant properties, friction and wear, in particular the formation and durability of tribofilms. Another important route is the return to the use of biolubricants, but they are more vulnerable to oxidation than petroleum-based lubricants. Alternatives to optimize the tribological performance of green lubricants are presented, with a special focus on green nano-additives and the use of inert atmospheres. Finally, tribological aspects related to green steels will be discussed.



## Jacob Klein

Weizmann Institute of Science, Israel

PLENARY SPEAKER

### LECTURE

## Biolubrication: from basics to applications

### Biography

Affiliation: Weizmann Institute of Science, Israel

Jacob Klein is the Herman Mark Professor of Soft Matter Physics at the Weizmann Institute in Israel. From 2000-2007 he was the Dr. Lee's Professor of Chemistry at the University of Oxford and Head of its Physical and Theoretical Chemistry Department (2000-2005). His research interests have ranged from the dynamics and interfacial properties of polymers to the behaviour of confined fluids and biological lubrication. His honours include the High Polymer Physics Prize of the American Physical Society (1995), the 2011 Soft Matter and Biophysical Chemistry Award of the UK Royal Society of Chemistry, the 2012 Tribology Gold Medal, the 2015 David Turnbull Lectureship Award of the Materials Research Society, the 2017 Liquid Matter Prize of the European Physical Society, the 2019 Gold Medal of the Israel Chemical Society, the 2020 Rothschild Prize, the 2021 Irving Langmuir Award in Chemical Physics of the American Physical Society and the Overbeek Gold Medal of the European Colloid and Interface Society. In 2009 and 2017, he received ERC Advanced Grants. In 2013 he was elected to the European Academy and in 2016 he was elected to the Israel Academy of Science and Humanities.

### Abstract

Jacob Klein  
Weizmann Institute, Rehovot, Israel

Over the past two decades hydration lubrication, where sub-nanometer water layers surrounding charges provide remarkable reduction in friction between sliding surfaces, has emerged as a key organizing principle in reducing friction in aqueous and particularly biological environments. Early work described the basic nanotribological aspects of such lubrication<sup>1-6</sup>, while later studies identified bio-relevant vectors such as lipid bilayers as boundary lubricants<sup>7</sup>. In practical terms, osteoarthritis (OA), the most common and debilitating joint disease affecting some 500 millions world wide and of growing prevalence due to increasing human longevity and progressive aging of populations<sup>8</sup>, is associated with friction and wear of the articular cartilage coating the joints. Strategies to alleviate this disease by reducing cartilage friction are being developed, with remarkable new technologies becoming available<sup>9</sup>, and such approaches turn out also to be useful for novel materials properties<sup>10-13</sup>. The talk will describe advances and progress in exploiting biolubrication and mimicking Nature's solutions for novel treatments.

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## Jianbin Luo

Tsinghua University, China

PLENARY SPEAKER

### LECTURE

## Advances of Solid-Liquid Combined Superlubricity (SLCS)

### Biography

Jianbin Luo, a professor at Tsinghua University, received his Ph.D. from Tsinghua University in China in 1994. He joined the State Key Laboratory of Tribology (SKLT) in 1994, was elected to be an academician of Chinese Academy of Sciences in 2011, and an academician of TWAS (The World Academy of Sciences) in 2022. He is working in superlubricity and thin film lubrication. The total funding of the projects he has/had been responsible for over 700 million RMB. He has published more than 600 pieces of papers, 2 books and more than 200 authorized patents. He has won the China State Invention Award, the National Natural Science Award, etc. In 2013, he won the highest Award of American Society of Lubrication Engineers (STLE) - International Award and the Highest Achievement Award of Chinese Tribology Institute (CTI). He also won the Chen Jiageng Technology Science Award in 2021.

### Abstract

Jianbin Luo

State Key Laboratory of Tribology in Advanced Equipment, Tsinghua University, Beijing 100084, China

Email: [luojb@tsinghua.edu.cn](mailto:luojb@tsinghua.edu.cn)

Superlubricity has been developed quickly in the past 10 years and attracted more and more attentions from researchers over the world. Especially since the solid-liquid composite superlubricity system was proposed, the carrying capacity of the superlubricity state has been increased more than 10 times, the kinds of lubricants and friction pair materials that can achieve superlubricity state become more extensive. These conditions are closer to the actual working conditions of the industry and the possibility of superlubricity to be used in industry is greatly increased. These advances will be introduced in the presentation.

Key words: superlubricity, liquid superlubricity, solid-liquid combined superlubricity



## Noritsugu Umehara

Tsinghua University, China

PLENARY SPEAKER

### LECTURE

## Tribology for Sustainable Development

### Biography

Dr. Noritsugu Umehara is a professor in Department of Mechanical Engineering at Tsinghua University in China. He has interests in both fundamental and applied aspects of manufacturing and tribology, especially in new polishing method of advanced ceramic using magnetic field and water lubrication of advanced ceramics. He began his carrier at the Tohoku University in 1988 as a research associate in the Department of Mechanical Engineering before coming assistant professor in 1993, associate professor in 1995 and move to Nagoya University as Professor in 2003. In 2026, he moved to Tsinghua University as a Professor. He received a Bachelor, a Master and a Doctor of Engineering from Tohoku University, Sendai, Miyagi in 1983, 1985 and 1988, respectively. He published research papers more than 250 in various journals, and hold 6 Patents on Magnetic Fluid Grinding and more than 20 Patents on Tribology. Dr. Umehara received the JSME Young Engineering award in 1991, 1995 LaRoux K. Gillespie Outstanding Young Manufacturing Engineer Award from the society of manufacturing engineers in 1995, F.W. Tayler Medal from the CIRP in 1995 and JSME paper awards in 2010, 2019 and 2022. He is member of the American Society of Mechanical Engineers (ASME), the Japan Society of Mechanical Engineers (JSME) as a fellow, the Japan Society for Precision Engineering (JSPE) as a fellow, the Japan Society of Tribologist (JAST) and the Japan Society for Grinding Engineering. He was a past President of Japanese Society of Tribologist in 2022-2023. He is Editorial Board Members as the following Journals of Journal of Engineering Tribology, Proceedings of the Institution of Mechanical Engineers Part J, Friction, Springer and Journal Tribologi, Malaysian Tribology Society.

### Abstract

*Noritsugu Umehara*

In order to avoid global warming caused by greenhouse gases as chlorofluorocarbons and carbon dioxide gases, alternative refrigerant, fuel and lubricants in combustion engine should be developed in Tribology. The use of biofuels and bio-lubricants is considered to achieve carbon neutrality which fixes carbon dioxide gases even if they are generated. However, severe corrosion and wear could be a problem after generation of various acids during combustion. In order to overcome these problems, proper hard coatings as DLC are required for the protection of corrosion and wear in bio-fuel and bio-lubricants. Olive oil shows low friction coefficient as 0.02 in the sliding of CNx coated disk against Si<sub>3</sub>N<sub>4</sub> ball under boundary lubrication condition because of large amount of oleic acid in olive oil. Wear is small because both sliding pair is fine for anti-corrosion. Also there are some problems in renewable energy plant as geothermal power plant. Clogging of steam pipes and turbine blades with silica and calcium oxides is occurred after the precipitation from high-temperature and high-pressure water. In order to overcome this problem, low adhesion strength coating against the precipitation of impurities in high temperature and high pressure water should be developed. It has been found that DLC films with high hydrogen content, low dangling bond density and small density of edges with small ID/IG ratio showed low silica adhesion for practical application.

# Peter Jost Award Winners

Award recipients presented chronologically from 2024 to 2026.



## Feng Zhou

Lanzhou Institute of Chemical Physics, CAS, China

PETER JOST AWARD 2024

### LECTURE

## Harmonious Tribo-Interfaces Enabled by Soft Matters

### Biography

Prof. Dr. Feng Zhou is a full Professor in Lanzhou Institute of Chemical Physics, CAS and Deputy director of State Key Laboratory of Solid Lubrication. He gained PhD in 2004 and spent three years (2005-2008) in the Department of Chemistry, University of Cambridge as a research associate. He has published more than 500 journal papers that received more than 40000 citations and has an H-index of 100 according to Google Scholar. His research interests include the biomimic surfaces/interfaces of soft matters, drag-reduction and antibiofouling, and bioinspired tribology, functional coatings. He has gained a number of awards including "Outstanding Youth Award" of International Society of Bionic Engineering, 2013. The Second Class National Prize of Natural Science, 2015; Distinguished Visiting Fellowship, Royal Academy of Engineering, UK, 2016 and Peter Jost Award of International Tribology Council. He serves as co-editor-in-chief of Tribology International and associate editor of Lubrication Science.

### Abstract

*Feng Zhou*

*State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, CAS.  
18 Middle Tianshui Road, Lanzhou, 730000 China*

In 1991, the Nobel laureate P. G. de Gennes introduced the concept of "soft matter" (materials that assume an intermediate state between solids and ideal fluids, typically distinguished by their susceptibility to deformation under the influence of feeble external forces and frequently associated with intricate molecular - level interactions). This concept has, ever since, garnered widespread international acclaim. The employment of soft matter materials to dissipate the contact stress at the interface of rigid - acting components constitutes a cardinal principle within the realm of material system design. Through such utilization, it becomes feasible to mitigate friction and wear, thereby guaranteeing the seamless and dependable operation of machinery. This accomplishment not only makes a substantial contribution to the objectives of energy conservation and emission reduction but also assumes paramount significance in the domains of both high - end civilian and military equipment. The research has pioneered an innovative methodology for the design and synthesis of soft matter materials. They have triumphantly fabricated an array of such materials, encompassing oils, greases, polymer brushes, composite hydrogels, and coatings. The team has methodically probed into the friction - related behaviors and lubrication mechanisms of these materials. Furthermore, they propounded the scientific tenet of "wet - adhesion - sliding" research, thereby clarifying the intricate correlations among wetting and lubrication, wetting and adhesion, as well as adhesion and lubrication. On the basis of these research outcomes, they engineered wet - adhesion - sliding and protective materials that are characterized by their low - friction properties and high load - bearing capabilities. In addition, they contrived novel materials such as ionic lubricants and supramolecular gel lubricants, thereby effectively propelling the advancement and practical application of soft matter materials in the high - end equipment sector.



## Juliette Cayer-Barrioz

CNRS / Ecole Centrale de Lyon, France

PETER JOST AWARD 2025

### LECTURE

## How Surface Topography and Chemistry Control Lubrication

### Biography

Juliette Cayer-Barrioz graduated in Physics from the University of Grenoble in 1998 and in Mechanical Engineering from the Ecole Centrale de Lyon (ECL) in 2000 before obtaining her PhD in Materials Science from ECL in 2003 and her Habilitation in Mechanics in 2011. Since 2005, she has been associated with the French National Centre for Scientific Research (CNRS). Her research activities at the Laboratoire de Tribologie et Dynamique des Systèmes (LTDS) in Ecole Centrale de Lyon focus on surface phenomena and dynamics of confined lubricated interfaces. Her multidisciplinary approach—based on unique experimental devices developed at the LTDS—combines physics, interfacial chemistry and mechanics, rheology and friction. After an eight-year contribution to the Laboratoire d'Excellence Manutech-Sise, she served for four years as a member of the French National Committee of the CNRS in mechanics. She is an editor of Tribology Letters. Her teaching activities at ECL, and beyond, address the physics and chemistry of interfaces and the rheology of complex media. She was awarded the 2025 Peter Jost Award in Tribology.

### Abstract

*Juliette Cayer-Barrioz*

*Laboratoire de Tribologie et Dynamique des Systèmes, CNRS UMR5513, Ecole centrale de Lyon, France*

The idea of using a liquid to separate two solid surfaces in contact under pressure is not new. This thin lubricating film can support a load, reduce energy losses, protect the surfaces from wear and corrosion, remove wear debris and dissipate heat. Thus, lubrication mechanisms can be examined in terms of film-forming capacity and friction dissipation. The lubricated contact is a complex system whose behaviour and evolution are influenced by the interfacial geometry at the macro- and micro-scales, the tribological conditions and the rheology of the lubricant. The high contact stresses can cause it to act as a 'mechano-chemical reactor' to trigger reactions of the lubricant and its additives to form tribofilms and/or influence the adsorption of boundary layers. These complex interfaces are investigated here by integrating experimental, numerical and theoretical approaches. It covers all lubrication regimes, from the thin full-film regime, in which deformed surfaces are fully separated by a pressurised fluid film, to the boundary lubrication regime, in which protruding asperities come into contact. The experimental approach spans a wide range of spatial and time scales; film thicknesses range from nanometres to hundreds of nanometres and timescales from a few hundredths of a milliseconds to essentially quasistatic sliding. This approach was used to provide a fundamental understanding of a wide range of phenomena from film formation under oscillating contacts, friction reduction by the control of adsorbed films and molecular organization on the surface, the influence of surface roughness and texturing on lubrication regime transitions, aqueous lubrication... The capabilities of this integrated theoretical and experimental approach are illustrated to demonstrate the importance of surface topography and the physical chemistry on friction, as well as showing how complex fluids can lubricate the surface to provide a detailed understanding the mechanisms occurring within lubricated contacts. This presentation will focus on how these fundamental insights can have had a significant impact on society and the environment.



## Tianbao Ma

Tsinghua University, China

PETER JOST AWARD 2026

### LECTURE

## Understanding and controlling superlubricity of solids

### Biography

Dr. Tianbao Ma is a full professor at State Key Laboratory of Tribology, Tsinghua University. He also serves as the director of the Institute of Tribology in Mechanical Engineering Department. His research interests include friction mechanisms, superlubricity, and tribochemistry. He has published a total of 128 papers, including journals of Nature Materials, Nature Communications, Friction, Tribology International, Science China Technological Sciences, International Journal of Extreme Manufacturing, etc., which has been cited 6,000 times in total on web of science. He has been authorized 17 patents. He is the recipient of the First-Class Natural Science Award of Beijing, the Xplorer Prize from the New Cornerstone Science Foundation and Taiho Encouraging Award for Young Tribologists. He serves as the editorial board member of "Science China Technological Sciences" and advisory board member of "RSC Mechanochemistry".

### Abstract

*Tianbao Ma*

The state of superlubricity of solids has been predicted and realized for recent three decades. The presentation will firstly overview some important advancement in this field. Then I will introduce some work in our group for understanding and controlling superlubricity of solids, including a fundamental perspective of interfacial friction due to sliding induced charge density redistribution and friction tuning by external electric fields, achievement of microscale superlubricity of 2D heterogeneous interfaces and graphene-coated multi-asperity contact, tribochemistry-induced robust superlubricity of amorphous carbon films under extreme conditions. Finally, future prospects will be discussed, such as, new effects of superlubricity should be studied at fundamental level, and novel materials design and preparation should be conducted for industrial application of superlubricity of solids.





## Lars Pastewka

University of Freiburg, Germany

PETER JOST AWARD 2026

### LECTURE

## The mechanics of contact between rough surfaces

### Biography

Lars Pastewka is a Professor of Simulation in the Department of Microsystems Engineering at the University of Freiburg. His research employs computer simulations at atomic and mesoscopic scales to investigate mechanical processes, with a focus on contact, adhesion, and friction. Prof. Pastewka received his Ph.D. in Physics from the University of Freiburg while working at Fraunhofer IWM. He completed a postdoctoral fellowship at Johns Hopkins University and led a junior research group at the Karlsruhe Institute of Technology before joining the University of Freiburg as a faculty member in 2017. He has been recipient of a Fulbright Fellowship, a Marie Skłodowska-Curie Fellowship, an Emmy-Noether Award and an ERC Starting Grant.

### Abstract

*Lars Pastewka*

Natural and engineered surfaces are almost universally rough across multiple length scales, often exhibiting self-affine scaling from millimeters down to nanometers. This multiscale topography controls how surfaces interact — heat and electrical conduction, adhesion, sealing, and wear all depend on roughness. When rough bodies are pressed together, contact occurs only at a sparse set of patches representing a small fraction of the nominal area. In this talk, I will present two decades of progress in understanding the mechanics of rough interfaces, drawing on large-scale numerical simulations that bridge the gap from boundary-element calculations to molecular dynamics. These simulations reveal how true contact area, interfacial stiffness, and gap topography emerge from surface statistics, and how lubricants flow within the gap. I will also address the origin of roughness itself: simulations of plastic deformation in contact suggest that self-affine scaling emerges spontaneously from heterogeneous plastic flow, offering a potential explanation for the universal observation of self-affine roughness. Throughout, I will emphasize the interplay of theory, simulation, and topographic measurement.



# Program Overview

20-25 September 2026

| World Tribology Congress 2026 |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
|-------------------------------|-----------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------|
| SUNDAY                        | MONDAY                                        | TUESDAY                                                          | WEDNESDAY                                              | THURSDAY                                                | FRIDAY                                          |                                                                       |
| 20 Sep. 2026                  | 21 Sep. 2026                                  | 22 Sep. 2026                                                     | 23 Sep. 2026                                           | 24 Sep. 2026                                            | 25 Sep. 2026                                    |                                                                       |
| 8:00-8:30                     | Registration Opening 8:00                     |                                                                  |                                                        |                                                         |                                                 |                                                                       |
|                               | Exhibition & Fair (9:00 - 17:00)              |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 8:30-9:00                     |                                               | Plenary Lecture - Prof. Jacob Klein (8:30 - 9:30)                | Plenary Lecture - Henara Costa (8:30 - 9:30)           | Plenary Lecture - Noritsugu Umehara (8:30 - 9:30)       | Plenary Lecture - Bharat Bhushan (8:30 - 9:30)  |                                                                       |
| 9:00-9:30                     | Opening Ceremony (9:00 - 9:50)                |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 9:30-10:00                    | Plenary Lecture - Ali Erdemir (9:50 - 10:50)  | Technical Sessions 3 (9:30 - 10:50)                              | Technical Sessions 7 (9:30 - 10:50)                    | Technical Sessions 11 (9:30 - 10:50)                    | Technical Sessions 15 (9:30 - 10:50)            |                                                                       |
| 10:00-10:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 10:30-11:00                   | Coffee Break (10:50 - 11:30)                  | Poster Session 1 & Coffee Break (10:50 - 11:30)                  | Poster Session 3 & Coffee Break (10:50 - 11:30)        | Poster Session 5 & Coffee Break (10:50 - 11:30)         | Coffee Break (10:50 - 11:30)                    |                                                                       |
| 11:00-11:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 11:30-12:00                   | Plenary Lecture - Jianbin Luo (11:30 - 12:30) | Technical Sessions 4 (11:30 - 12:30)                             | Technical Sessions 8 (11:30 - 12:30)                   | Technical Sessions 12 (11:30 - 12:30)                   | Technical Sessions 16 (11:30 - 12:30)           |                                                                       |
| 12:00-12:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 12:30-13:00                   | Lunch Break (12:30 - 14:00)                   | Sponsor Lecture - Anton Paar (12:40 - 13:40)                     | Lunch Break (12:30 - 14:00)                            | Lunch Break (12:30 - 14:00)                             | Lunch Break (12:30 - 14:00)                     |                                                                       |
| 13:00-13:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 13:30-14:00                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 14:00-14:30                   | ITC in session meeting                        | Registration opens                                               | Peter Jost Award Feng Zhou (14:00 - 14:40)             | Peter Jost Award Juliette Cayer-Barrioz (14:00 - 14:40) | Peter Jost Award Lars Pastewka (14:00 - 14:40)  | Peter Jost Award Tianbao Ma (14:00 - 14:40)                           |
| 14:30-15:00                   |                                               |                                                                  |                                                        |                                                         |                                                 | Technical Sessions 17 (14:00 - 16:00)                                 |
| 15:00-15:30                   |                                               | Technical Sessions 1 (14:40 - 16:00)                             | Technical Sessions 5 (14:40 - 16:00)                   | Technical Sessions 9 (14:40 - 16:00)                    | Technical Sessions 13 (14:40 - 16:00)           |                                                                       |
| 15:30-16:00                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 16:00-16:30                   |                                               | Coffee Break (16:00 - 16:40)                                     | Poster Session 2 & Coffee Break (16:00 - 16:40)        | Poster Session 4 & Coffee Break (16:00 - 16:40)         | Poster Session 6 & Coffee Break (16:00 - 16:40) | Coffee Break (16:00 - 16:40)                                          |
| 16:30-17:00                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 17:00-17:30                   |                                               | Technical Sessions 2 (16:40 - 18:20)                             | Technical Sessions 6 (16:40 - 18:00)                   | Technical Sessions 10 (16:40 - 18:40)                   | Technical Sessions 14 (16:40 - 18:40)           | 2026 ASME International Mayo D. Hersey Award Ceremony (16:30 - 16:45) |
| 17:30-18:00                   |                                               |                                                                  |                                                        |                                                         |                                                 | Closing Session & Awards (16:45 - 17:45)                              |
| 18:00-18:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 18:30-19:00                   | Welcome Reception (18:00 - 19:30)             | Forum Young Tribologists - Roundtable Meentoring (18:20 - 19:20) | Roundtable - International Cooperation (18:00 - 19:30) |                                                         |                                                 |                                                                       |
| 19:00-19:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 19:30-20:00                   |                                               | Forum Young Tribologist Evening (19:30 - 21:30)                  |                                                        | Gala Dinner (19:30 - 22:00)                             |                                                 |                                                                       |
| 20:00-20:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 20:30-21:00                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |
| 21:00-21:30                   |                                               |                                                                  |                                                        |                                                         |                                                 |                                                                       |

# Programme at a Glance

Key moments from the congress week.

## Sunday - 20 Sep

ITC in-session meeting; registration opens; Young Tribologists elevator pitches; Welcome Reception.

## Monday - 21 Sep

Opening Ceremony; plenary lectures by Ali Erdemir and Jianbin Luo; Technical Sessions 1-2; Young Tribologists activities.

## Tuesday - 22 Sep

Plenary lecture by Jacob Klein; Poster Sessions 1-2; Technical Sessions 3-6; Juliette Cayer-Barrioz award ceremony; International Cooperation Roundtable.

## Wednesday - 23 Sep

Plenary lecture by Henara Costa; Poster Sessions 3-4; Technical Sessions 7-10; Lars Pastewka award ceremony; Gala Dinner.

## Thursday - 24 Sep

Plenary lecture by Noritsugu Umehara; Poster Sessions 5-6; Technical Sessions 11-14; Tianbao Ma award ceremony.

## Friday - 25 Sep

Plenary lecture by Bharat Bhushan; Technical Sessions 15-17; ASME Mayo D. Hersey Award Ceremony; Closing Session & Awards.



Plenary / Awards



Technical Sessions



Poster / Coffee



Social / Special

# Floor Plan

Windsor Convention & Expo Centre - key congress locations.

## Basement - Americas Rooms

Registration, coffee breaks and poster sessions.

## First Floor - Europa Rooms

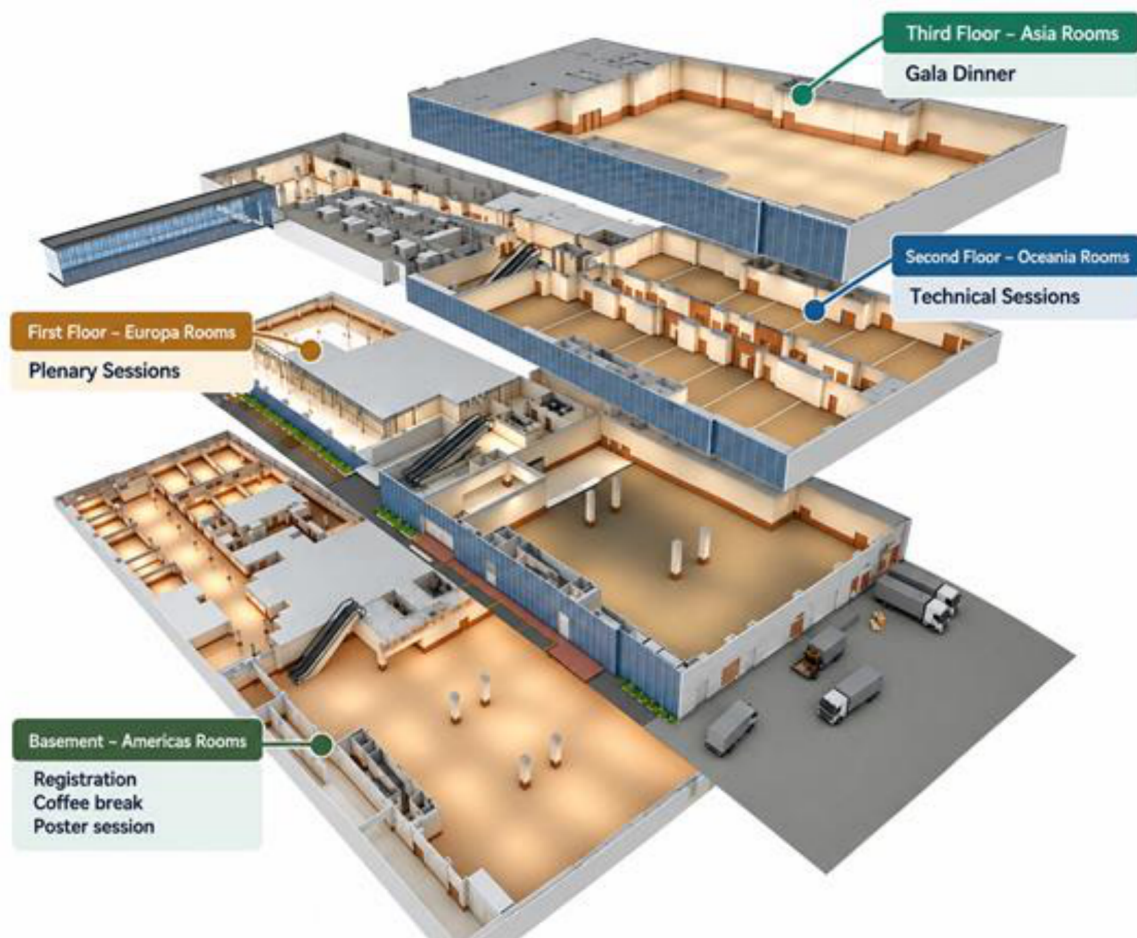
Plenary sessions.

## Second Floor - Oceania Rooms

Technical sessions.

## Third Floor - Asia Rooms

Gala Dinner.



# Useful Information

Essential on-site information for participants and presenters.

## FREE WI-FI FOR PARTICIPANTS

Login  
**WTC2026**

Password  
**wtc@2026**

## Registration & Information Desk

| Date                  | Opening Hours | Location                 |
|-----------------------|---------------|--------------------------|
| September 20, 2026    | 14:00-18:00   | Basement - America Rooms |
| September 21-24, 2026 | 08:00-18:00   | Basement - America Rooms |
| September 25, 2026    | 08:00-12:30   | Basement - America Rooms |

## 1. Oral Presentations

- Supported presentation formats are Microsoft PowerPoint (PPT/PPTX) and PDF. Presentations created on macOS must be saved in a format fully compatible with Windows PCs. A PDF backup is strongly recommended.
- All presentations should use a 16:9 aspect ratio to ensure optimal display on the screens.
- If your presentation includes videos, audio, animations or other multimedia content, test all files in advance to ensure proper playback.

# Oral Presentation Guidelines

Presentation times, file upload and technical preparation.

## Presentation Time

| Type             | Duration                      |
|------------------|-------------------------------|
| Plenary Talk     | 60 min (50 min + 10 min Q&A;) |
| Peter Jost Award | 40 min (30 min + 10 min Q&A;) |
| Keynote Talk     | 30 min (25 min + 5 min Q&A;)  |
| Invited Talk     | 25 min (20 min + 5 min Q&A;)  |
| Oral Talk        | 20 min (15 min + 5 min Q&A;)  |

## Presentation File Upload & Technical Testing

### Session Room Setup

Please arrive at your assigned session room at least 30 minutes before the start of your session to upload and test your presentation on the room computer. There is no dedicated Speaker Ready Room.

- Time Management: if you upload or copy your presentation during the session, this time - as well as any time spent resolving technical issues - will be deducted from your allocated presentation time.
- USB Storage: bring your presentation on a virus-checked USB drive for quick transfer to the session room computer.
- Welcome & Introduction: introduce yourself to the Session Chair upon arrival.
- Technical Assistance: familiarise yourself with the presentation equipment before your session. On-site audio-visual assistance will be available.
- Personal Laptops & Adapters: presenters are strongly encouraged to use the computer provided in the session room. If a personal laptop is necessary, bring the appropriate display adapter and a USB backup.

## 2. Poster Presentations

Poster format, preparation and display information.

**90 cm x 120 cm**

Maximum poster size - portrait orientation

### Format

- Each poster must not exceed 90 cm (width) x 120 cm (height) and must be prepared in portrait orientation to fit the poster board.
- Authors are required to prepare their posters using the official poster template.



Official poster template

### Poster Preparation

- The Conference Organiser will provide poster boards. Each board will be clearly identified with its assigned Poster Number.
- Poster presenters are responsible for printing and bringing their own posters. Posters must be displayed during the designated setup period.
- On-site staff and volunteers will assist presenters in locating assigned boards and obtaining mounting materials.
- All presenters are expected to remain by their posters and engage with participants throughout their designated poster session.

### POSTER AREA

Basement - Americas Rooms

# Poster Session Schedule

Setup and removal times for all six poster sessions.

| Session | Date               | Time        | Poster Setup | Poster Removal |
|---------|--------------------|-------------|--------------|----------------|
| 1       | September 22, 2026 | 10:50-11:30 | From 08:00   | By 12:00       |
| 2       | September 22, 2026 | 16:00-16:40 | From 14:00   | By 17:30       |
| 3       | September 23, 2026 | 10:50-11:30 | From 08:00   | By 12:00       |
| 4       | September 23, 2026 | 16:00-16:40 | From 14:00   | By 17:30       |
| 5       | September 24, 2026 | 10:50-11:30 | From 08:00   | By 12:00       |
| 6       | September 24, 2026 | 16:00-16:40 | From 14:00   | By 17:30       |

## Important

Presenters are kindly requested to remove their posters by the designated removal time. Posters left on the boards after this time will be removed by the Organising Committee. The Committee cannot be held responsible for uncollected posters.

## Presenter checklist

Bring your printed poster - check your Poster Number - arrive during the setup window - stay with your poster during the designated session - remove it by the stated deadline.

# Congress Tracks

Thematic tracks and their organisers.

01

## Surface Engineering

Track Organisers: Koshi Adachi, Tianmin Shao, Carsten Gachot.

02

## Sustainable Tribology - Green Tribology and Energy Transition

Track Organisers: Mitjan Kalin, Henara Lillian Costa, TVVLN Rao.

03

## Surface Metrology and Contact Mechanics

Track Organisers: Roberto Martins Souza and Noël Brunetiere.

04

## Nanoscale Mechanisms of Friction and Lubrication

Track Organisers: Martin Dienwiebel, Michael Moseler, Fabrice Dassenoy.

05

## Advances in Tribochemistry and Lubrication Mechanisms: Emerging Insights into Lubricants and Additives

Track Organisers: Maria Isabel de Barros, Benyebka Bou-Said, Ardian Morina.



# Congress Tracks

Thematic tracks and their organisers. - continued.

06

## **Tribology in Manufacturing, Mining, Transport Systems and Integrated Circuits**

Track Organisers: Xinchun Lu, Mohamed El Mansori.

07

## **Tribology of Extreme Environments: Aerotribology, Ocean Tribology and Space Tribology**

Track Organisers: Ian Sherrington, Hong Liang, Sergei Glavatskih and Weimin Liu.

08

## **Biotribology, Biomimetics & Food Tribology**

Track Organisers: Jacob Klein, Jason Stokes, Wuge Briscoe and Markus A. Wimmer.

09

## **Tribo-Induced Surface and Subsurface Transformations**

Track Organisers: Peter Gumbsch, Sylvie Descartes.

10

## **Multiscale Approaches for Multiphysics Modelling and In Situ Experiments in Tribology**

Track Organisers: Martin H. Müser, Lars Pastewka, Michele Ciavarella.

# Congress Tracks

Thematic tracks and their organisers. - continued.

11

## **Triboelectric Nanogenerators for Energy and Sensors**

Track Organisers: Zhong Lin Wang, Tom Reddyhoff, Weiguo Hu, Shiquan Lin.

12

## **Tribomechadynamics, Tribotests and Monitoring**

Track Organisers: Amilcar Ramalho, Marcelo Braga dos Santos, Giuseppe Pintaude.

13

## **AI-STLE - Artificial Intelligence for Smart Tribology and Lubrication Engineering**

Track Organisers: Nick Garabedian, Max Marian, Prathima Nalam.

14

## **Young Tribologists Forum**

Track Organisers: Nathan Strey, Deborah de Oliveira, Alaitz Zabala.

## TRACK 01

### Surface Engineering

#### ORAL PRESENTATIONS

Monday, September 21

##### SESSION T01-S01

14:40 – 16:00 • OCEANIA X

**Session Chair(s):** Xinchun Chen

**14:50 - T01-S01.1**

ID: 4ESE

Keynote Speaker

**Atomic-level design for tribo-materials: a brief overview**

Tianbao Ma<sup>1</sup>, Zhiyue Xu<sup>1</sup>, Chengjun Huang<sup>1</sup>, Xinran Miao<sup>1</sup>, Weiqi Chen<sup>1</sup>, Aisheng Song<sup>1</sup>; <sup>1</sup>Tsinghua University

**15:20 - T01-S01.2**

ID: 4DMK

Oral presentation

**Laser Surface Texturing for Enhanced Tribological Performance of Polyetheretherketone (PEEK)**

Laura Peña Parás<sup>1</sup>, Demófilo Maldonado Cortés<sup>1</sup>, Fernando Xavier Pozos<sup>1</sup>, Daniel Durán<sup>1</sup>, Javier A. Ortega<sup>2</sup>, Melvin Alvarez Vera<sup>3</sup>; <sup>1</sup>Universidad de Monterrey, <sup>2</sup>University of Texas Rio Grande Valley, <sup>3</sup>Universidad de las Américas Puebla

**15:40 - T01-S01.3**

ID: 4DMN

Oral presentation

**Optimization of Cutting Tool Life Through Laser Surface Texturing and Extreme Pressure Lubricants**

Demófilo Maldonado Cortés<sup>1</sup>, Laura Peña Parás<sup>1</sup>, José Antonio Charles Herrera<sup>1</sup>; <sup>1</sup>Universidad de Monterrey

##### SESSION T01-S02

16:40 – 17:40 • OCEANIA X

**Session Chair(s):** Carsten Gachot

**16:40 - T01-S02.1**

ID: 4DMX

Oral presentation

**Humidity-Driven Tribological Mechanisms of Ground Micro-Arc Oxidation Coatings on Aluminium Alloy**

Karl Delbé<sup>1</sup>, Jean Denape<sup>1</sup>, Jean-Yves Paris<sup>1</sup>, Louis Rodriguez<sup>2</sup>; <sup>1</sup>Université de Technologie de Tarbes, <sup>2</sup>Liebherr-Aerospace Coatings SAS

**17:00 - T01-S02.2**

ID: 4DNM

Oral presentation

**Tribologically Modified Tooth Geometries of Worm Wheels using Automated Optimization Algorithm**

Luis Haug<sup>1</sup>, Simon Tillmann<sup>1</sup>, Michael Geitner<sup>1</sup>, Karsten Stahl<sup>1</sup>; <sup>1</sup>Technical University of Munich, Gear Research Centre

**17:20 - T01-S02.3**

ID: 4DPJ

Oral presentation

**Molybdenum Coatings for Extreme Environments: Tribological Study of PVD and APS Coatings**

Ricardo Alves da Silva Crespo Martins<sup>1</sup>, Dennis Konopka<sup>1</sup>, Martin Nicolaus<sup>1</sup>, Florian Pape<sup>1</sup>, Benedict Rothhammer<sup>2</sup>, Markus Polzer<sup>2</sup>, Kai Möhwald<sup>1</sup>, Gerhard Poll<sup>1</sup>, Max Marian<sup>3,1</sup>; <sup>1</sup>Leibniz University Hannover, <sup>2</sup>Friedrich Alexander Universität Erlangen Nürnberg, <sup>3</sup>Pontificia Universidad Católica de Chile

**Tuesday, September 22****SESSION T01-S03**

09:30 – 10:50 • OCEANIA X

Session Chair(s): Deli Duan

**09:35 - T01-S03.1**

ID: 4DVW

Invited Speaker

**Design of macroscale solid superlubricating surface on steel substrate**

Li Ji<sup>1</sup>, Hongxuan Li<sup>1</sup>, Panpan Li<sup>1</sup>, Huidi Zhou<sup>1</sup>, Jianmin Chen<sup>1</sup>, Xiaohong Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**10:00 - T01-S03.2**

ID: 4DPY

Oral presentation

**Defect-controlled hydrogenated tetrahedral amorphous carbon with enhanced corrosion and wear resistance in NH<sub>4</sub>OH dilute environment**

Jae-Il Kim<sup>1</sup>, Ji-Woong Jang<sup>1</sup>, Jongkuk Kim<sup>1</sup>, Young-Jun Jang<sup>1,2</sup>; <sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>University of Science and Technology

**10:20 - T01-S03.3**

ID: 4DQW

Oral presentation

**Transition Metal Carbo Chalcogenides (TMCCs): a novel family of 2D solid lubricants**

Edoardo Marquis<sup>1</sup>, Michael Naguib<sup>2</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>Tulane University

**SESSION T01-S04**

11:30 – 12:30 • OCEANIA X

Session Chair(s): Liang Jiang

**11:30 - T01-S04.1**

ID: 4DQY

Oral presentation

**Accelerated Evaluation of Coating Performance Through Parallel Testing**

Lais M. Lopes<sup>1</sup>; <sup>1</sup>Falex Tribology

**11:50 - T01-S04.2**

ID: 4DRP

Oral presentation

**The Promise of Solid Lubricants**

Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien

**12:10 - T01-S04.3**

ID: 4DRZ

Oral presentation

**Tribological Behavior of Magnetron-Sputtered MAX Phases: The Role of Surface Oxides**

Ronja Anton<sup>1</sup>, Daniel Pölzlberger<sup>2</sup>, Xudong Sui<sup>2</sup>, Nadine Laska<sup>1</sup>, Carsten Gachot<sup>2</sup>; <sup>1</sup>German Aerospace Center, <sup>2</sup>Technische Universität Wien

**SESSION T01-S05**

14:40 – 16:00 • OCEANIA X

**Session Chair(s):** Xiuqin Bai

**14:40 - T01-S05.1**

ID: 4DSJ

Oral presentation

**3 in 1 powder coatings with implemented antifriction function**

Dr. Michaela Gedan-Smolka<sup>1</sup>, Marcel Tuschla<sup>1</sup>, Peter Scholz<sup>2</sup>, Paul Pavlov<sup>3</sup>; <sup>1</sup>Leibniz-Institut für Polymerforschung Dresden, <sup>2</sup>Fraunhofer Institute for Machine Tools and Forming Technology, <sup>3</sup>Anton Paar Germany GmbH

**15:00 - T01-S05.2**

ID: 4DSQ

Oral presentation

**Simulating Damage Mechanisms in Quasistatic Sliding Contact of Friction Enhancing Surface Structures**

Jonathan Schanner<sup>1</sup>, Alexander Hasse<sup>1</sup>; <sup>1</sup>Technische Universität Chemnitz

**15:20 - T01-S05.3**

ID: 4DSS

Oral presentation

**Processing Relationships in Hybrid MXene Coatings for Advanced Solid Lubrication**

Martin Nastran<sup>1</sup>, Alex Werdaner<sup>1</sup>, Christina Danecker<sup>1</sup>, Edoardo Marquis<sup>1</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien

**15:40 - T01-S05.4**

ID: 4DTG

Oral presentation

**Understanding tribological behavior of new REACh compliant sealed anodization of aluminum alloys**

Marc Schmittbuhl<sup>1</sup>, Gilles Auregan<sup>2</sup>, Alex Jacoboni<sup>2</sup>, Joffrey Tardelli<sup>3</sup>, Marjorie Cavarroc-Weimer<sup>4</sup>, Vincent FRIDRICI<sup>5</sup>; <sup>1</sup>École Centrale de Lyon, <sup>2</sup>Safran Landing Systems, <sup>3</sup>Institut de Recherche Technologique Matériaux Métallurgie Procédés, <sup>4</sup>Safran Tech, <sup>5</sup>Centrale Lyon

**SESSION T01-S06**

16:40 – 17:40 • OCEANIA X

**Session Chair(s):** Tushar Khosla

**16:40 - T01-S06.1**

ID: 4DVE

Oral presentation

**Regulating Composition, Structure, and Friction Properties of Sputtered MoS<sub>2</sub> Films through Trace Metal (Pt, Au, Cu) Doping**

Bin Zhang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**17:00 - T01-S06.2**

ID: 4DWB

Oral presentation

**Influence of MoS<sub>2</sub> content on the tribological behavior of double-transfer solid lubrication systems**

Thomas Rey<sup>1,2</sup>, Eric Papin<sup>1</sup>, Fabrice Dassenoy<sup>3</sup>, Vincent FRIDRICI<sup>4</sup>; <sup>1</sup>Dipostel, <sup>2</sup>Laboratoire de Tribologie et Dynamique des Systèmes, <sup>3</sup>École Centrale de Lyon, <sup>4</sup>Centrale Lyon

**17:20 - T01-S06.3**

ID: 4DWE

Oral presentation

**Tribological properties of DLC coatings in high-pressure gaseous hydrogen**

Johnny Dufils<sup>1</sup>, Bogdan Munteanu<sup>1</sup>, Etienne Macron<sup>1</sup>; <sup>1</sup>IREIS - HEF Group

**Wednesday, September 23**

**SESSION T01-S07**

09:30 – 10:50 • OCEANIA X

**Session Chair(s):** Huan Liu**09:30 - T01-S07.1**

ID: 4E44

Oral presentation

**Effect of laser shock peening on tribological performance of 15CrNiMo carburized layer in multi-body friction systems**Guorong Wang<sup>1</sup>, Yang Wang<sup>1</sup>, Xia He<sup>1</sup>, Lin Zhong<sup>1</sup>, Gang Wei<sup>1</sup>; <sup>1</sup>Southwest Petroleum University**09:50 - T01-S07.2**

ID: 4EBB

Oral presentation

**Phosphate coatings for protection of steels surfaces**Rowena Crockett<sup>1</sup>, Ueli Angst<sup>2</sup>, Mohammad Alinezhadfar<sup>1</sup>; <sup>1</sup>Swiss Federal Laboratories for Materials Science and Technology, <sup>2</sup>Swiss Federal Institute of Technology / Eidgenössische Technische Hochschule ETH Zürich**10:10 - T01-S07.3**

ID: 4EBV

Oral presentation

**Thermal isolation effect of DLC coatings on steel substrates**Mitjan Kalin<sup>1</sup>, Elton De Lima Savi<sup>1</sup>, Nelson G. C. Astrath<sup>2</sup>, Luis Carlos Malacarne<sup>2</sup>, Eduardo Victor Bergmann<sup>2</sup>, Tomaž Požar<sup>1</sup>; <sup>1</sup>University of Ljubljana, <sup>2</sup>Universidade Estadual de Maringá**10:30 - T01-S07.4**

ID: 4DPW

Oral presentation

**A bioinspired approach using hierarchically structured DLC multilayer coatings for tribological applications**Markus Polzer<sup>1</sup>, Alexandra Neumann<sup>1</sup>, Benedict Rothhammer<sup>2</sup>, Sandro Wartack<sup>1</sup>; <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, <sup>2</sup>Friedrich Alexander Universität Erlangen Nürnberg**SESSION T01-S08**

11:30 – 12:30 • OCEANIA X

**Session Chair(s):** Tianyi Han**11:30 - T01-S08.1**

ID: 4ECC

Oral presentation

**Slurry erosive wear of DLC (a-C) coated alloys for oil and gas applications**Juliana Souza de Oliveira<sup>1</sup>, Rubson Mação Camporez<sup>1</sup>, Natasha Vieira Dantas<sup>1</sup>, Newton Kiyoshi Fukumasu<sup>2</sup>, ANDRÉ PAULO TSCHIPTSCHIN<sup>2</sup>, Nathan Fantecelle Strey<sup>1</sup>, Cherlio Scandian<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>Universidade de São Paulo**11:50 - T01-S08.2**

ID: 4ECE

Oral presentation

**Study on high temperature tribological properties of self lubricating coatings**Bingxue Cheng<sup>1</sup>, Kaili Feng<sup>1</sup>, Yuhui Zou<sup>1</sup>, Yang Zheng<sup>1</sup>, Yihan Wang<sup>1</sup>, Tianmin Shao<sup>1</sup>; <sup>1</sup>Tsinghua University**12:10 - T01-S08.3**

ID: 4ECJ

Oral presentation

**Insights into the tribological and micro-impact behaviour of multilayer coatings based on TiN, CrN, ZrN, TiCrN and TiZrN**Daniel Toboła<sup>1</sup>, Ben Beake<sup>2</sup>, Łukasz Maj<sup>3</sup>, Tomasz Liskiewicz<sup>4</sup>, Cezary Drenda<sup>5</sup>; <sup>1</sup>Łukasiewicz Research Network – Krakow Institute of Technology, <sup>2</sup>Micro Materials Ltd., <sup>3</sup>Institute of Metallurgy and Materials Sciences, <sup>4</sup>Manchester Metropolitan University, <sup>5</sup>AGH University of Science & Technology**SESSION T01-S09**

14:40 – 16:00 • OCEANIA X

**Session Chair(s):** Pierluigi Bilotto

**14:40 - T01-S09.1**

ID: 4DZE

Oral presentation

**Influence of the Steel Disk Topography on the Friction Behavior of Wet Brakes and Clutches**

Patrick Strobl<sup>1</sup>, Prof. Dr.-Ing. Katharina Voelkel<sup>2</sup>, Karsten Stahl<sup>3,1</sup>; <sup>1</sup>Technical University of Munich, Gear Research Center, <sup>2</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, <sup>3</sup>Technical University of Munich, Gear Research Centre

**15:00 - T01-S09.2**

ID: 4ECW

Oral presentation

**Influence of Surface Slip on Hydrofoil Drag and Flow Noise Characteristics**

Manfu Zhu<sup>1</sup>, Weixi Huang<sup>1</sup>, Liran Ma<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University

**15:20 - T01-S09.3**

ID: 4ED6

Oral presentation

**Boride-based solid lubricants for extreme environments**

Daniel Pölzlberger<sup>1</sup>, Tomasz Wojcik<sup>1</sup>, Eleni Ntemou<sup>2</sup>, Daniel Primetzhofer<sup>2</sup>, Carsten Gachot<sup>3</sup>, Helmut Riedl<sup>1</sup>; <sup>1</sup>TU Wien, <sup>2</sup>Uppsala University / Uppsala Universitet, <sup>3</sup>Technische Universität Wien

**15:40 - T01-S09.4**

ID: 4EDT

Oral presentation

**High-Performance Flexible Electronics Fabricated Using a Surface Energy-Directed Assembly Process on Ultrathin Polyimide Substrates**

Zetong Li<sup>1</sup>, Zhimin Chai<sup>1</sup>; <sup>1</sup>Tsinghua University

**SESSION T01-S10**

16:40 – 18:00 • OCEANIA X

**Session Chair(s):** Edoardo Marquis

**16:40 - T01-S10.1**

ID: 4EEN

Oral presentation

**Lubricant film thickness for EHD contacts with diamond-like carbon coatings**

Yunbo Hao<sup>1</sup>, Marko Polajnar<sup>1</sup>, Tomaž Požar<sup>1</sup>, Mitjan Kalin<sup>1</sup>; <sup>1</sup>University of Ljubljana

**17:00 - T01-S10.2**

ID: 4EEZ

Oral presentation

**Understanding the color variation of TiO<sub>2</sub> thin layers by analyzing wear mechanisms of the oxide layer**

Sarah MARION<sup>1,2</sup>, Renée CHARRIERE<sup>1</sup>, Jenny Faucheu<sup>1</sup>, Clotilde MINFRAY<sup>2</sup>, Vincent FRIDRICI<sup>2</sup>; <sup>1</sup>École Nationale Supérieure des Mines de Saint Étienne, <sup>2</sup>Centrale Lyon

**17:20 - T01-S10.3**

ID: 4EG6

Oral presentation

**Optimization of Tribological Properties Based on the Example of Two-Component Surface Layer**

Jaroslav Sep<sup>1</sup>; <sup>1</sup>Rzeszow University of Technology

**17:40 - T01-S10.4**

ID: 4EBC

Oral presentation

**Dwell-time friction behavior of MoS<sub>2</sub>**

Frank W. DelRio<sup>1</sup>, Tomas F. Babuska<sup>1</sup>, Alex J. Mings<sup>1</sup>, Steven R. Larson<sup>1</sup>, Ping Lu<sup>1</sup>, John F. Curry<sup>1</sup>; <sup>1</sup>Sandia National Laboratories

**Thursday, September 24**

**SESSION T01-S11**

09:30 – 10:50 • OCEANIA X

**Session Chair(s):** Edoardo Marquis

**09:45 - T01-S11.1**

ID: 4EEM

Invited Speaker

#### Design and Protection Strategies of Organic Coatings

Haitao Duan<sup>1</sup>; <sup>1</sup>State Key Laboratory of Special Materials Surface Engineering, China Academy of Machinery Wuhan Research Institute of Materials Protection Co., Ltd.,

**10:30 - T01-S11.3**

ID: 4EKW

Oral presentation

#### Development and characterisation of highly ordered and aligned nanocomposite coating through anodization for tribological applications

Susanta Ugar<sup>1</sup>, Musuvathi Santhaparipoornam Bobji<sup>1</sup>; <sup>1</sup>Indian Institute of Science, Bengaluru

### SESSION T01-S12

11:30 – 12:30 • OCEANIA X

**Session Chair(s):** Ken Nakano

**11:30 - T01-S12.1**

ID: 4EMD

Oral presentation

#### Effect of gas nitriding on tribological and fretting characteristics of 3D-printed Ti-6Al-4V alloy in simulated body fluid

Serhii Lavrys<sup>1</sup>, Jozas Padgurskas<sup>1</sup>, Iryna Pohrelyuk<sup>2</sup>; <sup>1</sup>Vytautas Magnus University, <sup>2</sup>Karpenko Physico-Mechanical Institute of the NAS of Ukraine

**11:50 - T01-S12.2**

ID: 4EKT

Oral presentation

#### Influence of surface texture edge angle on tribological performance of laser textured tools in sheet metal forming

Ainhoa Guinea<sup>1</sup>, Andrea Aginagalde<sup>1</sup>, Eneko Saenz de Argandoña<sup>1</sup>, Joseba Mendiguren<sup>1</sup>, Francisco José Profito<sup>2</sup>, Henara Lillian Costa<sup>3</sup>, Alaitz Zabala<sup>1</sup>; <sup>1</sup>Universidad de Mondragon Mondragon Unibertsitatea, <sup>2</sup>Universidade de São Paulo, <sup>3</sup>Universidade Federal do Rio Grande

**12:10 - T01-S12.3**

ID: 4EPV

Oral presentation

#### Surface Topography effect on Compound Layer Thickness in Plasma-Nitrided Gray Cast Iron

Bruno Barbosa de Aquino<sup>1</sup>, Nathan Filipe Andrioni<sup>1</sup>, Milena Pan Tavares<sup>1</sup>, Alicia Correa Lucena<sup>1</sup>, Francisco Cavilha Neto<sup>1</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

### SESSION T01-S13

14:40 – 16:00 • OCEANIA X

**Session Chair(s):** Noritsugu Umehara

**14:40 - T01-S13.1**

ID: 4EQ4

Oral presentation

#### Hydrophobic Surface Functionalization via Ultrashort-Pulse Laser Texturing

Alexandre Vieira<sup>1,2</sup>, Wieslaw Antoni Grabon<sup>3</sup>, Marcin Adamiak<sup>4</sup>, Wagner de Rossi<sup>5</sup>, Gilmar Ferreira Batalha<sup>1</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Centro Universitário SENAI São Paulo, <sup>3</sup>Rzeszow University of Technology, <sup>4</sup>Silesian University of Technology in Gliwice, <sup>5</sup>Instituto de Pesquisas Energéticas e Nucleares



**15:00 - T01-S13.2**

ID: 4EQE

Oral presentation

**Slurry-erosive wear behaviour of a-C:Si:O:H coatings deposited by PECVD**

Juliana Souza de Oliveira<sup>1</sup>, [Patrick Silva](#)<sup>1</sup>, Rubson Mação Camporez<sup>2</sup>, Dante Ferreira Franceschini Filho<sup>3</sup>, Nathan Fantecelle Strey<sup>1</sup>, Cherlio Scandian<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO, <sup>3</sup>Universidade Federal Fluminense

**15:20 - T01-S13.3**

ID: 4EQT

Oral presentation

**Surface integrity of powder metallurgy gears after mild shot peening**

Matheus Monteiro de Siqueira Santos<sup>1</sup>, Felipe de Sá Carneiro<sup>2</sup>, [Izabel Lima Criscuolo](#)<sup>2</sup>, Ronnie Rodrigo Rego<sup>2</sup>; <sup>1</sup>Instituto Federal de São Paulo, <sup>2</sup>Instituto Tecnológico de Aeronáutica

**15:40 - T01-S13.4**

ID: 4EQW

Oral presentation

**Effect of Plasma Nitriding on Abrasive Wear Resistance of Chromium White Cast Iron**

[Eduardo de Souza Cardoso](#)<sup>1</sup>, Roberto Binder<sup>1</sup>, Cristiano Binder<sup>1</sup>, José Daniel Biasoli Mello<sup>2</sup>, Diego Berti Salvaro<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina, <sup>2</sup>Universidade Federal de Uberlândia

**SESSION T01-S14**

16:40 – 17:40 • OCEANIA X

**Session Chair(s):** MASAYUKI OCHIAI**16:40 - T01-S14.1**

ID: 4ERP

Oral presentation

**Effects of ultrasonic surface rolling processing on the surface properties of 4Cr13 stainless steel**

[Xiaoshuang Luo](#)<sup>1</sup>, Dan Jia<sup>1</sup>, Shengpeng Zhan<sup>1</sup>, Tian Yang<sup>1</sup>, Haitao Duan<sup>1</sup>, Suling Huang<sup>1</sup>, Haitao Duan<sup>1</sup>; <sup>1</sup>State Key Laboratory of Special Materials Surface Engineering, China Academy of Machinery Wuhan Research Institute of Materials Protection Co., Ltd.,

**17:00 - T01-S14.2**

ID: 4ESD

Oral presentation

**Enhanced High-Temperature Tribological Properties of Double Co-Doped DLC Coatings Prepared by FCVA**

[Ruixi Zhang](#)<sup>1</sup>, Takayuki Tokoroyama<sup>2</sup>, Yuki Hirata<sup>1</sup>, Noritsugu Umehara<sup>2</sup>; <sup>1</sup>Institute of Science Tokyo, <sup>2</sup>Nagoya University

**17:20 - T01-S14.3**

ID: 4ERV

Oral presentation

**Tribological performance of single-step fs-laser-induced dual-scale surface structures on Ti6Al4V**

Iñigo Fernandez de Arroyabe<sup>1</sup>, Andrea Aginagalde<sup>1</sup>, Ainhoa Guinea<sup>1</sup>, Jörn Bonse<sup>2</sup>, Dirk Spaltmann<sup>2</sup>, [Alaitz Zabala](#)<sup>1</sup>; <sup>1</sup>Universidad de Mondragon Mondragon Unibertsitatea, <sup>2</sup>Federal Institute for Material Research and Testing

**Friday, September 25****SESSION T01-S15**

09:30 – 10:50 • OCEANIA X

**Session Chair(s):** Hiroyoshi Tanaka**09:30 - T01-S15.1**

ID: 4ESF

Oral presentation

**Tribocorrosive Wear in Miller Tests of Tool Steels and High Chromium Cast Iron Used in Mining Industry**

[Jeilce Maria Abreu dos Santos](#)<sup>1</sup>, Leandro Moreira Pinto<sup>1</sup>, Nirvana Cecilia Ribeiro<sup>1</sup>, Jose Jimmy Penagos<sup>1</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale

**09:50 - T01-S15.2**

ID: 4ESH

Oral presentation

**Influence of microstructure and hardness of WC-Co studs on laboratory and HPGR field test performance**

Jeilce Maria Abreu dos Santos<sup>1</sup>, Victor Cardoso Campideli<sup>1</sup>, Gustavo Tressia de Andrade<sup>1</sup>, Jose Jimmy Penagos<sup>1</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale

**10:30 - T01-S15.4**

ID: 4ET6

Oral presentation

**The effect of structure on the wear resistance of a hydrotalcite-like coating grown on Zn alloy substrate**

Sławomir Zimowski<sup>1</sup>, Małgorzata Zimowska<sup>2</sup>, Dzmitry Kharytonau<sup>2</sup>, Viktoryia Chaprasava<sup>2</sup>, Jolanta Krupa<sup>3</sup>; <sup>1</sup>AGH University of Krakow, <sup>2</sup>Jerzy Haber Institute of Catalysis and Surface Chemistry, PAS Krakow, <sup>3</sup>AGH University of Science & Technology

**SESSION T01-S18**

09:30 – 10:50 • OCEANIA I

**Session Chair(s):** Xiuqin Bai**10:10 - T01-S18.3**

ID: 4F4D

Oral presentation

**Effect of triangular shaped textures on the performance of mechanical seals**

Lassad AMAMI<sup>1</sup>, Laurent Cougnon<sup>1</sup>, Anthony Fernandes<sup>1</sup>, Noel Brunetiere<sup>2</sup>; <sup>1</sup>Centre Technique des Industries Mécaniques, <sup>2</sup>Institut Pprime

**10:30 - T01-S18.4**

ID: 4F4X

Oral presentation

**From Plasma Surface Alloying to Integrated Surface Engineering Strategies: a Route to Densify Gray Iron Surfaces**

Tainá Pigosso<sup>1</sup>, Sofia Biscaro Coser<sup>1</sup>, Nathan Filipe Andrioni<sup>1</sup>, Francisco Cavilha Neto<sup>1</sup>, Alicia Correa Lucena<sup>1</sup>, Guilherme Oliveira Neves<sup>2</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina, <sup>2</sup>Universidad del BíoBío

**SESSION T01-S16**

11:30 – 12:30 • OCEANIA X

**Session Chair(s):** Ken Nakano**11:30 - T01-S16.1**

ID: 4ETA

Oral presentation

**Influence of Environmental Molecules on the Nano-interface Structure of Hydrogenated Carbon Nitride Coatings under Dry Conditions**

Kazuya Kuriyagawa<sup>1</sup>, Shogo Yanagida<sup>1</sup>, Koshi Adachi<sup>1</sup>; <sup>1</sup>Tohoku University

**11:50 - T01-S16.2**

ID: 4ETV

Oral presentation

**Molecular Dynamics Study of the Mechanical and Tribological Characteristics of Metal-Doped DLC Nanocomposite Coatings**

Sang-Hoon Lee<sup>1</sup>, Koo-Hyun Chung<sup>2</sup>, Hyun-Joon Kim<sup>1</sup>; <sup>1</sup>Kyungpook (Kyungbook) National University, <sup>2</sup>University of Ulsan

**SESSION T01-S19**

11:30 – 12:30 • OCEANIA I

**Session Chair(s):** MASAYUKI OCHIAI**11:30 - T01-S19.1**

ID: 4F6M

Oral presentation

**Tribological Behavior of Plasma-Nitrided Steels Evaluated by Gear Contact Fatigue Test**

Tainan Daniel Andrioni<sup>1</sup>, Francisco Cavilha Neto<sup>1</sup>, Milena Pan Tavares<sup>1</sup>, João Pedro Vaz Silveira<sup>1</sup>, Gisele Hammes<sup>1</sup>, Cristiano Binder<sup>1</sup>, Diego Berti Salvaro<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**12:10 - T01-S19.3**

ID: 4FAB

Oral presentation

**Effect of plasma nitriding on electrified tribological contacts: the case of oil-lubricated AISI 4140 steel**

Júlia Afonso Pires<sup>1</sup>, Diandra Grossmann Pereira<sup>1</sup>, Tainan Daniel Andrioni<sup>1</sup>, Diego Berti Salvaro<sup>1</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**SESSION T01-S20**

14:00 – 16:00 • OCEANIA I

**Session Chair(s):** Xinchun Chen**14:20 - T01-S20.2**

ID: 4FAP

Oral presentation

**Robust & Eco-Efficient Design Toward Innovative Coatings**

Cédric POUPON<sup>1</sup>; <sup>1</sup>AIRBUS

**15:00 - T01-S20.4**

ID: 4FBR

Oral presentation

**Enhanced Tribological Performance of Fluorine-Doped Diamond-Like Carbon Films on Rough Stainless Steel Substrates**

Bruno Borges Ramos<sup>1</sup>, Gisele Hammes<sup>1</sup>, Cristiano Binder<sup>1</sup>, José Daniel Biasoli Mello<sup>2</sup>; <sup>1</sup>Universidade Federal de Santa Catarina, <sup>2</sup>Universidade Federal de Uberlândia

**15:20 - T01-S20.5**

ID: 4FDK

Oral presentation

**Enhancing the tribological performances of aviation gears via tailored surface texturing**

Qingwen Dai<sup>1</sup>, Wei Huang<sup>1</sup>, Xiaolei Wang<sup>1</sup>; <sup>1</sup>Nanjing University of Aeronautics & Astronautics

**15:40 - T01-S20.6**

ID: 4DMP

Oral presentation

**Experimental and Numerical Investigation of Tribological Performance and Failure Mechanisms in Nanocomposite Coatings**

Zulfiqar Khan<sup>1</sup>; <sup>1</sup>Bournemouth University

**SESSION T01-S17**

14:00 – 16:00 • OCEANIA X

**Session Chair(s):** Tushar Khosla**14:00 - T01-S17.1**

ID: 4EW6

Oral presentation

**An Investigation of Temperature-Dependent Tribological Behavior and Wear Mechanisms of ID-HVOF-Sprayed Inconel 718 Coatings**

Sara Blunk<sup>1</sup>, Maya M. Harfouche<sup>1</sup>, Wendong Fang<sup>1</sup>, Maniya Aghasibeig<sup>2</sup>, Richard R. Chromik<sup>1</sup>; <sup>1</sup>McGill University, <sup>2</sup>National Research Council of Canada

**14:20 - T01-S17.2**

ID: 4EYM

Oral presentation

**Surface Texturing as a Game Changer for Forging Dies**

Julia Hummel Della Barba<sup>1</sup>, Beatriz de Andrade Ornellas<sup>2</sup>, JANAINA FRACARO DE SOUZA GONÇALVES<sup>1</sup>, Bruna Zappelino Camillo<sup>2</sup>, Marcelo Taveira Veiga<sup>3</sup>, Thiago Pereira<sup>3</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Centro Universitário SENAI SC, <sup>3</sup>Senai Innovation Institute for Manufacturing System and Laser Processing

**14:40 - T01-S17.3**

ID: 4EYR

Oral presentation

**Electrified Tribological Behavior and Semiconducting Response of DLC Coatings on Tool Steel**

Lázaro Aleixo dos Santos<sup>1</sup>, Evaldo José Corat<sup>2</sup>, Vladimir Jesus Trava-Airoldi<sup>2</sup>, Roberto Martins de Souza<sup>1</sup>, ANDRÉ PAULO TSCHIPTSCHIN<sup>1</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Instituto Nacional de Pesquisas Espaciais

**15:00 - T01-S17.4**

ID: 4EZR

Oral presentation

**Friction and wear performance of nano-multi layered DLC**

Hiro Yoshi Tanaka<sup>1</sup>, Taketo Inoue<sup>1</sup>, Nobuyuki Terayama<sup>2</sup>, Akira Nishimura<sup>3</sup>, Su-Min Bae<sup>4</sup>, Hiroyuki Kousaka<sup>4</sup>; <sup>1</sup>Kyushu University, <sup>2</sup>Shinko Seiki, <sup>3</sup>Shinko Seiki Co., Ltd, <sup>4</sup>Gifu University

**15:20 - T01-S17.5**

ID: 4F24

Oral presentation

**Development of high hardness and high nitrogen content ta-CN<sub>x</sub> film**

Wakita Shoma<sup>1</sup>, Noritsugu Umehara<sup>1</sup>, Takayuki Tokoroyama<sup>1</sup>, Ruixi Zhang<sup>2</sup>; <sup>1</sup>Nagoya University, <sup>2</sup>Institute of Science Tokyo

**15:40 - T01-S17.6**

ID: 4F26

Oral presentation

**Load-insensitive mild wear in tool steels via duplex nitriding/AlCrN and a monoclinic ZrO<sub>2</sub> nanoparticle topcoat**

Rafael Luciano Dalcin<sup>1</sup>, Cristiano José Scheuer<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Maria

## POSTER PRESENTATIONS

### Tuesday, September 22

#### SESSION Poster 01

10:50 – 11:30 • America

**01.1 ID: 4EFT - Duplex Treatement of AISI H13 Tool Steel: Hot-Forging Testing**

Alexandre da Silva Rocha<sup>1</sup>, João Vitor Piovesan Dalla Nora<sup>1</sup>, Felipe Canal<sup>1</sup>, Frederico Murilo Wlassak<sup>1</sup>, Steffen Aichholz<sup>2</sup>, Rafael Silva<sup>2</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Sul, <sup>2</sup>Oerlikon Balzers

**01.2 ID: 4F6N - Influence of the Wetting Angle of DLC Coatings Deposited on AISI 2205 in Pinon-Disk Wear Tests**

Andressa Boeno de Lima<sup>1</sup>, Edson Cezar Grzebielucka<sup>1</sup>, Helga Elisabeth Pinheiro Schluter<sup>2</sup>, Anderson Geraldo Marenda Pukasiewicz<sup>1</sup>, Denilson José Marcolino de Aguiar<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Petróleo Brasileiro S.A

**01.3 ID: 4ECS - Comparative analysis and optimization of tribological properties of burnished and vapour-blasted surfaces using TOPSIS**

Andrzej Dzierwa<sup>1</sup>; <sup>1</sup>Rzeszow University of Technology

**01.4 ID: 4EG4 - Evaluation of friction and electrochemical behavior of UHMWPE biopolymer against CoCrMo**

César Sedano de la Rosa<sup>1</sup>, Sara Ivette Topete Velasco<sup>1</sup>, Martín Flores Martínez<sup>1</sup>, Ezequiel Alberto Gallardo Hernández<sup>2</sup>, Ulises Alberto García Ramírez<sup>1</sup>, María de Montserrat García Rivera<sup>1</sup>; <sup>1</sup>Universidad de Guadalajara, <sup>2</sup>Instituto Politécnico Nacional

**01.5 ID: 4E4X - Tribological analysis of scratch resistance in plasma-sprayed thermal barrier coatings (TBCs)**

Bianca Costa Rodrigues<sup>1</sup>, Renata Jesuina Takahashi<sup>1</sup>, Vera Lúcia de Othéro de Brito<sup>2</sup>, Danieli Aparecida Pereira Reis<sup>1</sup>; <sup>1</sup>Universidade Federal de São Paulo, <sup>2</sup>Departamento de Ciência e Tecnologia Aeroespacial

**01.6 ID: 4EVC - Study of tribological and corrosion properties of two-layer coatings based on TiO<sub>2</sub>-Cr<sub>2</sub>O<sub>3</sub>/Ta**

Daur Kakimzhanov<sup>1</sup>, Bauyrzhan Rakhadilov<sup>1</sup>, Zarina Satbayeva<sup>1</sup>; <sup>1</sup>Shakarim University

**01.7 ID: 4F6W - Tribological Behaviour of DLC-Coated Surfaces Under Electrified Lubricated Sliding Contacts**

Diandra Grossmann Pereira<sup>1</sup>, Tainan Daniel Andrioni<sup>1</sup>, Júlia Afonso Pires<sup>1</sup>, Diego Berti Salvaro<sup>1</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**01.8 ID: 4EGM - Influence of Surface Free Energy on the Slurry-Jet Erosion Behavior of Thermally Sprayed Ceramic Coatings**

Arthur Soares Fernandes Ferreira<sup>1</sup>, Edson Cezar Grzebielucka<sup>1</sup>, Hipolito Carvajal Fals<sup>1</sup>, Irene Bida de Araújo Siqueira<sup>2</sup>, Helga Elisabeth Pinheiro Schluter<sup>3</sup>, Anderson G.M. Pukasiewicz<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Lactec Institute of Technology for Development, <sup>3</sup>Petróleo Brasileiro S.A

**01.9 ID: 4EHS - Tribological Behavior of Copper-Coated Basalt Fiber Reinforced Composites for EMI Shielding Applications**

Gi Hyun Yoon<sup>1</sup>, Dogyun Byeon<sup>1</sup>, Sungmin Yoon<sup>1</sup>; <sup>1</sup>Changwon National University

**01.10 ID: 4EHG - Scratch Response in SS316L Across Rolling, Powder Metallurgy, and Additive Manufacturing**

Izabel Fernanda Machado<sup>1</sup>, Samira Tahanzadeh<sup>1</sup>, Vanessa Seriacopi<sup>2</sup>, Daniel Rodrigues<sup>3</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Maua Institute of Technology, <sup>3</sup>BRATS Sintered Filters and Powder Metallurgy Products

**01.11 ID: 4EFW - Evaluation of the tribocorrosion behavior in seawater of multilayers Cr/CrC/Cr/DLC/Cr/CNx/Cr/DLC deposited by HiPIMS on AISI 4317 steel.**

Jesús Chagoya-Serna<sup>1</sup>, Ulises Alberto García Ramírez<sup>1</sup>, Sara Ivette Topete Velasco<sup>1</sup>, Jesús Alejandro Rodríguez-Herrera<sup>1</sup>, Andrés González-Hernández<sup>2</sup>, Luis Alberto López-Tejeda<sup>1</sup>, Martín Flores Martínez<sup>1</sup>; <sup>1</sup>Universidad de Guadalajara, <sup>2</sup>Universidad Autónoma de Tamaulipas

**01.12 ID: 4EJF - Tribological properties of Fe-Cu-Ni sinters prepared by ball milling and hot pressing**

Joanna Borowiecka-Jamrozek<sup>1</sup>; <sup>1</sup>Kielce University of Technology

**01.13 ID: 4EZP - Wear behaviour of coatings processed by PTA-DED modified by pre-deposition of graphene nanoplatelets and graphite particles**

João Felipe Sippel<sup>1</sup>, Ana Sofia Clímaco Monteiro D'Oliveira<sup>1</sup>; <sup>1</sup>Universidade Federal do Paraná

**01.14 ID: 4EF2 - Analysis of wear behavior of single- and multilayer coatings subjected to cyclic micro-impact loading**

Jolanta Krupa<sup>1</sup>, Sławomir Zimowski<sup>1</sup>; <sup>1</sup>AGH University of Krakow

**01.15 ID: 4ERG - Analysis of Dry Wear of Non-Heat-Treated Martensitic Stainless Steel Coating Applied in the Thermomechanical Steelmaking Process**

Josiara Novoa<sup>1</sup>, Márcio L. A. Cunha<sup>2</sup>, Hellen T. S. Moreira<sup>3</sup>, Henara L. Costa<sup>3</sup>; <sup>1</sup>Universidade Federal de Pelotas, <sup>2</sup>Arcelor Mittal Brasil, <sup>3</sup>Universidade Federal do Rio Grande

**01.16 ID: 4EBS - Tribological Performance of Epoxy Composites Reinforced with Tailings of Scheelite**

Clarissa Danielle Mendonça de Oliveira Guimarães<sup>1</sup>, Hong Liang<sup>2</sup>, Íngride Pamilly Ribeiro Araújo de Oliveira<sup>3</sup>, Juliana Ricardo de Souza<sup>3</sup>; <sup>1</sup>Universidade de Brasília, <sup>2</sup>Texas A&M University, <sup>3</sup>Universidade Federal Rural do Semi

**01.17 ID: 4EJW - Abrasive Wear and Friction Behaviour of 60%WC–NiCrBSi Hardfacing Pad Welds Modified with Rare Earth Oxides**

Justyna Kasińska<sup>1</sup>; <sup>1</sup>Kielce University of Technology

**01.18 ID: 4EQC - Comparison of tribological properties of CrN and CrN/DLC coatings under lubrication with Ringer's solution and artificial saliva**

Krystyna Joanna Radoń-Kobus<sup>1</sup>, Monika Madej<sup>1</sup>, Joanna Kowalczyk<sup>1</sup>; <sup>1</sup>Kielce University of Technology

**01.19 ID: 4EQG - The effect of the concentration of 1-butyl-3-methylimidazolium methanesulfonate in the coolant on the tribological properties of a TiAlN coating**

Krystyna Joanna Radoń-Kobus<sup>1</sup>, Joanna Kowalczyk<sup>1</sup>, Monika Madej<sup>1</sup>, Marcin Kowalski<sup>2</sup>; <sup>1</sup>Kielce University of Technology, <sup>2</sup>Warsaw University of Technology

**01.20 ID: 4F6Z - Friction and Wear Behavior of Vacuum-Sintered WC–Co with Recycled Grinding Sludge**

Lucia Vieira<sup>1</sup>, Fábio Miranda<sup>2</sup>, Luan Matheus Chagas<sup>3</sup>, Julia M. de A. Abdala<sup>3</sup>, Suzilene Real Janasi<sup>2</sup>, Fernando Santos Ortega<sup>3</sup>; <sup>1</sup>Instituto Tecnológico de Aeronáutica, <sup>2</sup>BRATS – Ind. e Com. de Produtos Metálicos Especiais Ltda, <sup>3</sup>Universidade do Vale do Paraíba

**01.21 ID: 4E6P - Mechanical and tribological properties of DLC/MoS2 adaptive coatings**

Marcin Kot<sup>1</sup>, Piotr Osada<sup>1</sup>, Łukasz Major<sup>2,3</sup>, Jurgén Lackner<sup>4</sup>, Remigiusz Michalczewski<sup>5</sup>; <sup>1</sup>University of Krakow, <sup>2</sup>Polish Academy of Sciences, <sup>3</sup>Institute of Metallurgy and Materials Sciences, <sup>4</sup>Joanneum Research Forschungsges, <sup>5</sup>Łukasiewicz Research Network - Institute for Sustainable Technologies

**01.22 ID: 4F62 - Tribocorrosion and Scratch Behavior in Synthetic Seawater of DLC/CrC/CNx/CrC/Cr Multilayers Deposited by HIPIMS**

Martín Flores Martínez<sup>1</sup>, Luis Martín Flores Cova<sup>1</sup>, Luis Alberto López-Tejeda<sup>1</sup>, Andrés González-Hernández<sup>2</sup>; <sup>1</sup>Universidad de Guadalajara, <sup>2</sup>Universidad Autónoma de Tamaulipas

**01.23 ID: 4E4H - Friction and Adhesion of Superhydrophobic and Icephobic Concrete Coatings**

Michael Nosonovsky<sup>1</sup>, Konstantin Sobolev<sup>1</sup>, Marina Kozhukhova<sup>1</sup>, Venkata K. Kamuju<sup>1</sup>; <sup>1</sup>University of Wisconsin-Milwaukee

**01.24 ID: 4EHN - Effect of microstructure on the friction and wear mechanisms at the shoulder-clip interface in ductile cast iron railway components**

Natania Karoline da Vitoria Machado<sup>1</sup>, Victor Cardoso Campideli<sup>2</sup>, Eleir Mundim Bortoleto<sup>2</sup>; <sup>1</sup>Universidade Federal de Ouro Preto, <sup>2</sup>Instituto Tecnológico Vale

**01.25 ID: 4FBS - Roughness and Friction of Textured and Coated Skin-Pass Work Rolls**

Paulo Loureço Monteiro Junior<sup>1</sup>, Henara Lillian Costa<sup>2</sup>; <sup>1</sup>Universidade Federal de Uberlândia, <sup>2</sup>Universidade Federal do Rio Grande

**01.26 ID: 4F4P - Wear resistance of duplex coatings on Ti-6Al-4V alloy obtained by nitriding with subsequent PVD deposition of TiN and ZrN**

Serhii Lavrys<sup>1,2</sup>, Pranciškus Bakutis<sup>1,3</sup>, Mykhailo Student<sup>2</sup>, Juozas Padgurskas<sup>1</sup>, Oleksandra Student<sup>2</sup>, Volodymyr Hvozdet's'kyi<sup>2</sup>, Oleh Tkachuk<sup>2</sup>, Khrystyna Zadorozhna<sup>2</sup>, Aleksander Luk'yanenko<sup>2</sup>, Audrius Zunda<sup>1</sup>, Iryna Pohrelyuk<sup>2</sup>; <sup>1</sup>Vytautas Magnus University, <sup>2</sup>Karpenko Physico-Mechanical Institute of the NAS of Ukraine, <sup>3</sup>Kaunas Clinics

**01.27 ID: 4F4Q - Wear-resistant plasma-electrolytic oxidation coatings on Ti-6Al-4V alloy synthesised in an aluminate electrolyte containing chromium oxide**

Mykhailo Student<sup>1</sup>, Pranciškus Bakutis<sup>2,3</sup>, Juozas Padgurskas<sup>2</sup>, Serhii Lavrys<sup>2,1</sup>, Volodymyr Posuvailo<sup>1</sup>, Oleksandra Student<sup>1</sup>, Volodymyr Hvozdet's'kyi<sup>1</sup>, Khrystyna Zadorozhna<sup>1</sup>, Ihor Kovalchuk<sup>1</sup>, Iryna Pohrelyuk<sup>1</sup>; <sup>1</sup>Karpenko Physico-Mechanical Institute of the NAS of Ukraine, <sup>2</sup>Vytautas Magnus University, <sup>3</sup>Kaunas Clinics

**01.28 ID: 4FDM - Synergistic integration of ionic liquid and lubricant microcapsules for epoxy coatings with concurrent self-healing and superior wear resistance**

Xingwei Wang<sup>1</sup>, Yanhua Wang<sup>1</sup>, Yanliang Shen<sup>1</sup>, Peng He<sup>2</sup>, Bo Yu<sup>1</sup>, Qiangliang Yu<sup>1</sup>, Feng Zhou<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, <sup>2</sup>Wuhan Second Ship Design and Research Institute

**01.29 ID: 4F2Q - Build-height microstructural gradients as the primary driver of dry-sliding wear in WAAM ER308LSi**

Rudimar Luis Becker<sup>1</sup>, Rafael Luciano Dalcin<sup>1</sup>, William Lemos Bevilacqua<sup>1</sup>, Leandro João da Silva<sup>2</sup>, Cristiano José Scheuer<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Maria, <sup>2</sup>Universidade Federal do Paraná

**01.30 ID: 4F2A - Morphology-driven tribological performance of FFF-3D printed PLA composites reinforced with carbonaceous fillers**

Rafael Luciano Dalcin<sup>1</sup>, Samara Hermann<sup>1</sup>, Cristiano José Scheuer<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Maria

**01.31 ID: 4FDS - Low-Friction Boron-Doped Hydrogenated DLC Coatings under High-Temperature and High-Vacuum Environments**

Ruixi Zhang<sup>1</sup>, Takayuki Tokoroyama<sup>2</sup>, Daiki Yasuda<sup>2</sup>, Kodai Mori<sup>2</sup>, Noritsugu Umehara<sup>2</sup>; <sup>1</sup>Institute of Science Tokyo, <sup>2</sup>Nagoya University

**01.32 ID: 4ERH - Evolution of surface topography and micromechanical properties in polyurethane rail pads with service time**

Sandy Baru de Paula<sup>1,2</sup>, Eleir Mundim Bortoleto<sup>2</sup>, Victor Cardoso Campideli<sup>1,2</sup>, Angélica de Fátima Nogueira Vicente<sup>2</sup>; <sup>1</sup>Universidade Federal de Ouro Preto, <sup>2</sup>Instituto Tecnológico Vale

**01.33 ID: 4EF6 - Evaluation of friction and electrochemical properties between PEEK biopolymer and Ti6Al4V alloy immersed in SBF**

Sara Ivette Topete Velasco<sup>1</sup>, César Sedano de la Rosa<sup>1</sup>, Martín Flores Martínez<sup>1</sup>, José Jesús Chagoya Serna<sup>1</sup>, Ulises Alberto García Ramírez<sup>1</sup>; <sup>1</sup>Universidad de Guadalajara

**01.34 ID: 4F4S - Effect of preliminary nitriding on fretting resistance of bioactive coating on Ti-6Al-4V alloy**

Serhii Lavrys<sup>1</sup>, Oleh Tkachuk<sup>1</sup>, Roman Proskurnyak<sup>1</sup>, Iryna Pohrelyuk<sup>1</sup>, Juozas Padgurskas<sup>2</sup>; <sup>1</sup>Karpenko Physico-Mechanical Institute of the NAS of Ukraine, <sup>2</sup>Vytautas Magnus University

**01.35 ID: 4F4V - Combining physical and diffusion surface treatments for enhance the mechanical and tribological properties of titanium alloy**

Serhii Lavrys<sup>1,2</sup>, Oleksandr Tisov<sup>3</sup>, Magdalena Lepicka<sup>4</sup>, Juozas Padgurskas<sup>1</sup>, Oleksandr Kuprin<sup>5</sup>, Oleksandr Bondarchuk<sup>6</sup>, Iryna Pohrelyuk<sup>2</sup>; <sup>1</sup>Vytautas Magnus University, <sup>2</sup>Karpenko Physico-Mechanical Institute of the NAS of Ukraine, <sup>3</sup>Xi'an Jiaotong University, <sup>4</sup>Bialystok University of Technology, <sup>5</sup>National Science Center Kharkiv Institute of Physics and Technology, <sup>6</sup>International Iberian Nanotechnology Laboratory

**01.36 ID: 4EXE - Influence of DLC Deposition Parameters on Tribological Properties of X38CrMo16 Tool Steel**

Szymon Drabik<sup>1</sup>, Monika Madej<sup>1</sup>, Katarzyna Piotrowska<sup>1</sup>; <sup>1</sup>Kielce University of Technology

**01.37 ID: 4EYH - Gray Cast Iron coated with Inconel 625 via plasma sintering.**

Thiago Jesus do Carmo<sup>1</sup>, Jurandir Marcos Sá de Sousa<sup>2</sup>, Juliane Ribeiro da Cruz<sup>1</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Senai Innovation Institute for Manufacturing System and Laser Processing

**01.38 ID: 4ER6 - Effect of a Cr/CrC/TaCr/TaC/DLC multilayer coating deposited by HiPIMS on the tribocorrosion behavior of a biomedical CoCrMo alloy**

Ulises Alberto García Ramírez<sup>1,2</sup>, Jesús Chagoya-Serna<sup>1</sup>, Luis Alberto López-Tejeda<sup>1</sup>, Sara Ivette Topete Velasco<sup>1</sup>, César Sedano de la Rosa<sup>1</sup>, Martín Flores Martínez<sup>1</sup>; <sup>1</sup>Universidad de Guadalajara, <sup>2</sup>Instituto Tecnológico José Mario Molina Pasquel Y Henríquez

**01.39 ID: 4EX4 - Tribocorrosion in Grinding Media: Evaluation Using an Adapted Wet Rubber Wheel Test – ASTM G105**

Victor Cardoso Campideli<sup>1</sup>, Eleir Mundim Bortoleto<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale

**01.40 ID: 4ESK - Microstructure and Tribological Properties of Cold Sprayed Amorphous Coatings**

Wojciech Żórawski<sup>1</sup>, Anna Trelka-Druzic<sup>2</sup>, Anna Góral<sup>2</sup>, Medard Makrenek<sup>1</sup>, Szymon Kowalski<sup>1</sup>; <sup>1</sup>Kielce University of Technology, <sup>2</sup>Institute of Metallurgy and Materials Science, Polish Academy of Sciences

**01.41 ID: 4F4J - Tribological Characterization of a Laser-Processed Metal Matrix-Carbide Reinforced Composite**

Yuliia Chabak<sup>1</sup>, VASYL IEFREMENKO<sup>1</sup>, Bohdan Efremenko<sup>2</sup>; <sup>1</sup>Institute of Materials Research, Slovak Academy of Science, <sup>2</sup>Pryazovskyi State Technical University

**01.42 ID: 4ERE - Laser Irradiation Effect on Friction Behaviour at Sliding Interfaces of Various DLC Coatings**

Yutaro Nakamura<sup>1</sup>, TOMOKO HIRAYAMA<sup>1</sup>, Cheng Chen<sup>2</sup>, Dongfeng Diao<sup>2</sup>; <sup>1</sup>Kyoto University, <sup>2</sup>Shenzhen University



**01.43** ID: 4ETC - Friction Characteristics of Valve Plate Pair of Servo Motor Pump for Launcher TVC Actuator Application

ZOU jiangyu<sup>1</sup>, Dingchong LYU<sup>1</sup>, Jian FU<sup>1</sup>; <sup>1</sup>Beihang University (Beijing University of Aeronautics and Astronautics)

## TRACK 02

### Sustainable Tribology - Green Tribology and Energy Transition

## ORAL PRESENTATIONS

### Monday, September 21

#### SESSION P01

09:50 – 10:50 • EUROPA III-IV

**Session Chair(s):** José Daniel Biasoli Mello

#### 09:50 - P01.1

ID: 4FCD

Plenary Speaker

#### Enabling the Electric Vehicle Revolution: Overcoming Materials and Tribological Challenges for a Green and Sustainable Transportation Future

Ali Erdemir<sup>1</sup>; <sup>1</sup>Texas A&M University

#### SESSION T02-S01

14:40 – 16:00 • OCEANIA II

**Session Chair(s):** Henara Lillian Costa

#### 14:50 - T02-S01.1

ID: 4FBY

Keynote Speaker

#### Friction and Wear Control of Key Components in Marine Power System

Chengqing Yuan<sup>1</sup>, Zhiwei Guo<sup>1</sup>, Conglin Dong<sup>1</sup>; <sup>1</sup>Wuhan University of Technology

#### 15:20 - T02-S01.2

ID: 4DMD

Oral presentation

#### A Path Towards Superlubricity in Real EHL Contacts

Wassim Habchi<sup>1</sup>, Scott Bair<sup>2</sup>; <sup>1</sup>Lebanese American University, <sup>2</sup>Georgia Institute of Technology

#### 15:40 - T02-S01.3

ID: 4EKX

Oral presentation

#### Boundary lubrication performance of pure glycerol on steel-bronze contact

Nischal Pokharel<sup>1</sup>, Pär Marklund<sup>2</sup>, Kim Berglund<sup>1</sup>; <sup>1</sup>Luleå University of Technology, <sup>2</sup>Lulea University of Technology / Luleå tekniska universitet

#### SESSION T02-S02

16:40 – 17:40 • OCEANIA II

**Session Chair(s):** Hugh A. Spikes

**16:40 - T02-S02.1**

ID: 4DPQ

Oral presentation

**A Novel Triple-row Roller Bearing Test Rig for Evaluation of Grease Performance in Wind Turbines**

Yonggang Meng<sup>1</sup>, Chenhao Guan<sup>1</sup>, Jocelyn Zhao<sup>2</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Shell Technology (Shanghai) Ltd.

**17:00 - T02-S02.2**

ID: 4DPR

Oral presentation

**Friction and wear behaviour of PLA-based bio-composites reinforced with oleaginous flax shives**

LALLEMENT Mathias<sup>1</sup>, France Chabert<sup>1</sup>, Philippe EVON<sup>2</sup>, Tiphaine Mérian<sup>1</sup>, Karl Delbé<sup>1</sup>; <sup>1</sup>Université de Technologie de Tarbes, <sup>2</sup>Institut National Polytechnique de Toulouse

**17:20 - T02-S02.3**

ID: 4DPV

Oral presentation

**Impact of oil reconditioning on physico-chemical properties and tribological performance of lubricating oils.**

Myrna Carolina Cortes Morales<sup>1,2</sup>, Aldara Naveira Suarez<sup>2</sup>, Angels Salvador<sup>2</sup>, Marta Barreras Carracedo<sup>3</sup>, Roland Larsson<sup>1</sup>, Pär Marklund<sup>1</sup>; <sup>1</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>2</sup>SKF RecondOil, <sup>3</sup>ReenerCycle

## Tuesday, September 22

### SESSION T02-S03

09:30 – 10:50 • OCEANIA II

**Session Chair(s):** Diego Berti Salvato

**09:45 - T02-S03.1**

ID: 4FD4

Invited Speaker

**Invited Talk - Dr. Arup Gangopadhyay**

Arup Gangopadhyay<sup>1</sup>; <sup>1</sup>Ford Motor Co.

**10:10 - T02-S03.2**

ID: 4DRF

Oral presentation

**Effect of Methanol Engine Environment on Oil Degradation and Tribological Behavior of the Cylinder Liner**

Yufan Zhu<sup>1</sup>, Chang Ge<sup>1</sup>, Xuan Ma<sup>1</sup>, Xiqun Lu<sup>1</sup>; <sup>1</sup>Harbin Engineering University

**10:30 - T02-S03.3**

ID: 4DRH

Oral presentation

**Thermo-Mechanical and Tribological Behaviour of Epoxy-Based Composites for Lined Rock Cavern Hydrogen Storage**

Gustavo Nogueira Lopes da Silva<sup>1</sup>, Nazanin Emami<sup>1</sup>; <sup>1</sup>Lulea University of Technology / Luleå tekniska universitet

### SESSION T02-S04

11:30 – 12:30 • OCEANIA II

**Session Chair(s):** Michele Schirru

**11:30 - T02-S04.1**

ID: 4DS6

Oral presentation

**Performance of sustainable sealing materials in hydrogen**

Geraldine Theiler<sup>1</sup>, Natalia Cano Murillo<sup>1</sup>, Yoshinori Sawae<sup>2</sup>, SHINMORI HIRONORI<sup>2</sup>, Ayako Aoyagi<sup>3</sup>, Emiel Dobbelaar<sup>4</sup>; <sup>1</sup>Federal Institute for Material research and Testing, <sup>2</sup>Kyushu University, <sup>3</sup>nok Corporation, <sup>4</sup>Freudenberg Technology Innovation SE & Co. KG

**11:50 - T02-S04.2**

ID: 4DSN

Oral presentation

**Hard chrome substitution under tribological challenges: comparative study of EHCP and various coatings technologies**

Céline TREVISIOL<sup>1</sup>, Mathieu MARQUER<sup>1</sup>, Cyril FAYOLLE<sup>1</sup>, Jorge Arturo SOTO PUENTE<sup>1</sup>, David DUBLANCHE<sup>2</sup>, Philippe SPILERS<sup>3</sup>, Sébastien BEAUVAIS<sup>4</sup>, Yan-Ming CHEN<sup>1</sup>; <sup>1</sup>Centre Technique des Industries Mécaniques, <sup>2</sup>Bodycote, <sup>3</sup>APS Coating solutions, <sup>4</sup>Ouest Coating

**12:10 - T02-S04.3**

ID: 4DSR

Oral presentation

**ML-prediction of the Electrical Contact Resistance at the GDL–BPP Interface**

Víctor Román<sup>1,2</sup>, Varvara Asouti<sup>3,2</sup>, András Vernes<sup>1,4</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>Flow & Optimization, Software & Services, <sup>3</sup>National Technical University of Athens, <sup>4</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH

**SESSION T02-S05**

14:40 – 16:00 • OCEANIA II

**Session Chair(s):** Robert L. Jackson**14:40 - T02-S05.1**

ID: 4DST

Oral presentation

**Tribofilm Formation of Lubricant Additives in Ammonia Atmosphere**

Jie Zhang<sup>1</sup>, Matthias Eggenstein<sup>2</sup>, Janet S. S. Wong<sup>1</sup>, Hugh A. Spikes<sup>3</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Shell Global Solutions (Deutschland) GmbH, <sup>3</sup>Imperial College

**15:00 - T02-S05.2**

ID: 4DSX

Oral presentation

**Lubricity of Ethanol-Containing Gasoline**

Jie Zhang<sup>1</sup>, Eliane Gendreau<sup>2</sup>, Nestor U. Soriano, Jr.<sup>3</sup>, Janet S. S. Wong<sup>1</sup>, Hugh A. Spikes<sup>4</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Shell Research Limited, UK, <sup>3</sup>Shell Global Solutions (US) Inc., <sup>4</sup>Imperial College

**15:20 - T02-S05.3**

ID: 4DTA

Oral presentation

**Efficiency of sampling airborne wear particles generated by a pin-on-disc setup**

Oleksii Nosko<sup>1</sup>, Yurii Tsybrii<sup>1</sup>; <sup>1</sup>Gdansk University of Technology / Politechnika Gdanska

**15:40 - T02-S05.4**

ID: 4DTK

Oral presentation

**What is a wear part?**

Mathias Woydt<sup>1</sup>, Rolf Luther<sup>2</sup>; <sup>1</sup>MATRILUB, <sup>2</sup>German Society for Tribology e.V.

**SESSION T02-S06**

16:40 – 18:00 • OCEANIA II

**Session Chair(s):** Salete Martins Alves**16:40 - T02-S06.1**

ID: 4DVM

Oral presentation

**A modified bio-oil from Schizochytrium sp. microalgae as a lubricity improver**

Alejandro García Tuero<sup>1</sup>, Guillermo Díez Valbuena<sup>1</sup>, Rubén González Rodríguez<sup>1</sup>, José Luis Viesca Rodríguez<sup>1</sup>, Antolin Hernández Battez<sup>1</sup>; <sup>1</sup>Universidad de Oviedo

**17:00 - T02-S06.2**

ID: 4DW4

Oral presentation

**Designing safe and sustainable lubricant additives with reactive molecular dynamics**

Stefan J Eder<sup>1</sup>, Hendrik J Ehrich<sup>1</sup>, Lucia Pisarova<sup>1</sup>; <sup>1</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH

**17:20 - T02-S06.3**

ID: 4DWJ

Oral presentation

**Tribological Properties of Melamine Long-Chain Alcohol Ester Derivatives as Friction Modifiers at High Temperatures**

Wenjing Hu<sup>1</sup>, Jingchun Zhang<sup>1</sup>, Jiusheng Li<sup>1</sup>; <sup>1</sup>Shanghai Advanced Research Institute, Chinese Academy of Sciences

**17:40 - T02-S06.4**

ID: 4DRC

Oral presentation

**Investigating the Surface Fatigue Behaviour of Water-Based Lubricants in Applications Pertinent to EV Drive Units**

Haochen Yao<sup>1</sup>, Christine Matta<sup>2</sup>, Frank Berens<sup>2</sup>, Amir Kadiric<sup>1</sup>; <sup>1</sup>Imperial College, <sup>2</sup>SKF Research and Technology Development

**Wednesday, September 23****SESSION P04**

08:30 – 09:30 • EUROPA III-IV

**Session Chair(s):** José Daniel Biasoli Mello**08:30 - P04.1**

ID: 4DMM

Plenary Speaker

**Tribology and Energy Transition: a Brazilian Perspective**

Henara Lillian Costa<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande

**SESSION T02-S07**

09:30 – 10:50 • OCEANIA II

**Session Chair(s):** Andreas Rosenkranz**09:30 - T02-S07.1**

ID: 4DXD

Oral presentation

**Numerical investigation of the effects of abrasive particles in lubricating oil on the performance of hydrodynamic journal bearings used in aircraft engine power transmission systems**

Haykal BOUAJILA<sup>1</sup>, Jean BOUYER<sup>1</sup>, Pascal Jolly<sup>1</sup>, Balint PAP<sup>2</sup>, James COLE<sup>2</sup>, Younes AOUES<sup>3</sup>, <sup>1</sup>Université de Poitiers, <sup>2</sup>Safran Transmission Systems, <sup>3</sup>INSA Rouen Normandie

**09:50 - T02-S07.2**

ID: 4DYE

Oral presentation

**Bubble-assisted electrochemical MXenes as novel sustainable solid lubricant.**

Pierluigi Bilotto<sup>1</sup>, Marko Piljević<sup>2</sup>, Markus Ostermann<sup>1</sup>, Edoardo Marquis<sup>1</sup>, Manel Rodriguez Ripoll<sup>2</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH

**10:10 - T02-S07.3**

ID: 4DYH

Oral presentation

**A Boundary Element formulation for polymer bearings steady-state response**

Michele Santeramo<sup>1</sup>, Carmine Putignano<sup>1</sup>, Giuseppe Carbone<sup>2,1</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Nanjing University of Technology

**10:30 - T02-S07.4**

ID: 4DYP

Oral presentation

**Graphene oxide as an additive in aqueous lubricants containing glycol and glycerol**

Reza Najjari<sup>1</sup>, Siyu Wang<sup>2</sup>, Mahdi Mohammadpour<sup>2</sup>, Jonny Hansen<sup>3</sup>; <sup>1</sup>Loughbrough university, <sup>2</sup>Loughborough University, <sup>3</sup>TRATON Group

**SESSION T02-S08**

11:30 – 12:30 • OCEANIA II

**Session Chair(s):** Jitendra Kumar Katiyar**11:30 - T02-S08.1**

ID: 4DYW

Oral presentation

**Ammonia Production via Mechanocatalysis: A Molecular Dynamics Study**

Muhammad Aulia Rahman<sup>1</sup>, James P. Ewen<sup>2,1</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Bath

**11:50 - T02-S08.2**

ID: 4DZC

Oral presentation

**Viability of lubricating greases using functionalized cellulose as thickeners**

Jacob David Ross<sup>1</sup>, Jie Zhang<sup>1</sup>, Janet S. S. Wong<sup>1</sup>; <sup>1</sup>Imperial College London

**12:10 - T02-S08.3**

ID: 4DZN

Oral presentation

**Improvement of Efficiency performance of transaxle fluids for electric vehicles**

Pedro Cawich<sup>1</sup>, Scott Rajala<sup>1</sup>, Tatsumi Hiroyuki<sup>2</sup>; <sup>1</sup>Idemitsu Lubricants America Corp., <sup>2</sup>Idemitsu Kosan Co.,Ltd.

**SESSION T02-S09**

14:40 – 16:00 • OCEANIA II

**Session Chair(s):** Nathan Fantecelle Strey**14:40 - T02-S09.1**

ID: 4E2T

Oral presentation

**Aqueous Lubrication for EV Powertrains: A Multi-Scale Investigation of Tribofilm Formation Under Electrified Conditions**

Debashis Puhan<sup>1</sup>, Thawhid Khan<sup>1</sup>, Tom Slatter<sup>2</sup>, Mahdi Mohammadpour<sup>2</sup>, Rob Dwyer-Joyce<sup>1</sup>; <sup>1</sup>University of Sheffield, <sup>2</sup>Loughborough University

**15:20 - T02-S09.3**

ID: 4EE2

Oral presentation

**Lubricant Inerting - Enhancing Sustainability of Lubrication Systems**

Janet S. S. Wong<sup>1</sup>, Hugh A. Spikes<sup>2,1</sup>, Jie Zhang<sup>1</sup>, Vojin Lukic<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College

**15:40 - T02-S09.4**

ID: 4EBJ

Oral presentation

**Thermo-oxidative aging effects on the electrical and electro-tribological performance of e-fluids**

Fernando Soto-Nieto<sup>1</sup>, Andys Hernandez Peña<sup>1</sup>, Leonardo Israel Farfan Cabrera<sup>1</sup>; <sup>1</sup>Tecnológico de Monterrey

**SESSION T02-S10**

16:40 – 18:00 • OCEANIA II

**Session Chair(s):** Mitjan Kalin**16:40 - T02-S10.1**

ID: 4E4A

Oral presentation

**Lubricant inerting – base oil degradation in low oxygen atmosphere**Lenon Medina Ferreira<sup>1</sup>, Henara Lillian Costa Murray<sup>2</sup>, Janet S. S. Wong<sup>1</sup>, Hugh A. Spikes<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Universidade Federal do Rio Grande**17:00 - T02-S10.2**

ID: 4ECQ

Oral presentation

**Effect of hydrogen on the tribological properties of CoCrFeMnNi HEA**Aitor Ayerdi<sup>1</sup>, Andrea Aginagalde<sup>1</sup>, Wilson Tato<sup>1</sup>, Iñaki Hurtado<sup>1</sup>, Pablo Garcia-Michelena<sup>1</sup>, Rémi Piegard<sup>2</sup>, Daniella Guedes<sup>2</sup>, Alaitz Zabala<sup>1</sup>; <sup>1</sup>Universidad de Mondragon Mondragon Unibertsitatea, <sup>2</sup>Centre Technique des Industries Mécaniques**17:20 - T02-S10.3**

ID: 4EDC

Oral presentation

**Impact of Methanol Combustion on Piston Assembly Friction: A Combined Simulation and Experimental Study**Yelvin Ragimov<sup>1</sup>, Andreas Götze<sup>2</sup>, Georg Jacobs<sup>3</sup>, Merle Reimers<sup>1</sup>, Frank Atzler<sup>2</sup>; <sup>1</sup>MSE - RWTH Aachen University, <sup>2</sup>Dresden University of Technology, <sup>3</sup>RWTH Aachen University**17:40 - T02-S10.4**

ID: 4EDE

Oral presentation

**Electrical Properties of Tribofilms formed at Electrified Interfaces**Seong H. Kim<sup>1</sup>; <sup>1</sup>Pennsylvania State University**Thursday, September 24****SESSION P05**

08:30 – 09:30 • EUROPA III-IV

**Session Chair(s):** Salete Martins Alves**08:30 - P05.1**

ID: 4FCE

Plenary Speaker

**Tribology for Sustainable Development**Noritsugu Umehara<sup>1</sup>; <sup>1</sup>Tsinghua University**SESSION T02-S11**

09:30 – 10:50 • OCEANIA II

**Session Chair(s):** T V V L N Rao**09:45 - T02-S11.1**

ID: 4DNY

Invited Speaker

**Development of hBN-Based Epoxy Nanocomposite Coating for Enhanced Wear and Corrosion Resistance**Jitendra Kumar Katiyar<sup>1</sup>; <sup>1</sup>Manipal Institute of Technology, Manipal

**10:10 - T02-S11.2**

ID: 4ETX

Oral presentation

**Comparative Tribology Characterization of Hydrogen-Charged Steels**

Pedro Lucas Gomes de Souza Silveira<sup>1,2</sup>, Saete Martins Alves<sup>2</sup>; <sup>1</sup>Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Norte, <sup>2</sup>Universidade Federal do Rio Grande do Norte

**10:30 - T02-S11.3**

ID: 4ECP

Oral presentation

**Lubricant Inerting - Performance of antiwear additives in inert atmospheres**

Vojin Lukic<sup>1</sup>, Jie Zhang<sup>1</sup>, Janet S. S. Wong<sup>1</sup>, Hugh A. Spikes<sup>2,1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College

**SESSION T02-S12**

11:30 – 12:30 • OCEANIA II

**Session Chair(s):** Thomas Reddyhoff**11:30 - T02-S12.1**

ID: 4EE6

Oral presentation

**Shear Velocity Dependent Stick-Slip Motion of Soft and Hard Solid Interfaces**

Jitendra Kumar Katiyar<sup>1</sup>, Arun Kumar Singh<sup>2</sup>, Nitish Sinha<sup>3</sup>; <sup>1</sup>Manipal Institute of Technology, Manipal, <sup>2</sup>Visvesvaraya National Institute of Technology Nagpur, <sup>3</sup>Dr. C. V. Raman University Vaishali

**11:50 - T02-S12.2**

ID: 4EFD

Oral presentation

**Study on Groove Shape Design for Bearing Performance Improvement**

Keisei Watanabe<sup>1</sup>, Yuki Kawamoto<sup>1</sup>, MASAYUKI OCHIAI<sup>1</sup>; <sup>1</sup>Tokai University

**12:10 - T02-S12.3**

ID: 4EFE

Oral presentation

**Research on Improving Friction Reduction in Journal Bearings— Study and Evaluation of a New Micro-Bubble Generation Method —**

SHODAI SAKABE<sup>1</sup>, YUKI YOSHIMURA<sup>1</sup>, KOKI GONDA<sup>1</sup>, AKIHIKO AZETSU<sup>1</sup>, MASAYUKI OCHIAI<sup>1</sup>; <sup>1</sup>Tokai University

**SESSION T02-S13**

14:40 – 16:00 • OCEANIA II

**Session Chair(s):** Marcelo Braga dos Santos**14:40 - T02-S13.1**

ID: 4EFY

Oral presentation

**Evolution of 100Cr6 and 316L planes against 100Cr6 balls behavior in hydrogen environment with a high pressure tribometer**

Rémi Piegard<sup>1</sup>, Jorge Arturo SOTO PUENTE<sup>1</sup>, Pierre-Francois CARDEY<sup>1</sup>; <sup>1</sup>Centre Technique des Industries Mécaniques

**15:00 - T02-S13.2**

ID: 4EHH

Oral presentation

**Experimental and theoretical study of a multi-recess compliant hydrostatic thrust bearing**

Alice MARINESCU<sup>1</sup>, Aurelian FATU<sup>2</sup>, Yann HENRY<sup>2,3</sup>, Traian CICON<sup>4</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Université de Poitiers, <sup>3</sup>Institut Pprime, <sup>4</sup>National University of Science and Technology POLITEHNICA Bucharest

**15:20 - T02-S13.3**

ID: 4DQX

Oral presentation

**Impact of Electrical Current on the Tribological Performance of MoDTC Additives**

Zhengyuan PENG<sup>1</sup>, Frédéric GEORGI<sup>1</sup>, Pierre MONTMITONNET<sup>1</sup>, Imène Lahouij<sup>1</sup>; <sup>1</sup>Centre de Mise En Forme de Matériaux

**15:40 - T02-S13.4**

ID: 4EHZ

Oral presentation

**The effect of gallic acid derivatives additives in oil lubrication systems using SUJ2 steel**

Kazuki Ikoma<sup>1,2</sup>, Koshi Adachi<sup>1</sup>; <sup>1</sup>Tohoku University, <sup>2</sup>Railway Technical Research Institute

**SESSION T02-S14**

16:40 – 17:40 • OCEANIA II

**Session Chair(s):** Janet S. S. Wong**16:40 - T02-S14.1**

ID: 4EKA

Oral presentation

**Electro-Tribology and Electro-Rheology of Greases – Influence of Doping**

Paul Staudinger<sup>1</sup>, Kartik Pondicherry<sup>1</sup>; <sup>1</sup>Anton Paar GmbH

**17:00 - T02-S14.2**

ID: 4EKB

Oral presentation

**Environmental and tribological assessment of cutting fluids produced from aminolyzed castor oil**

Ney Francisco Ferreira<sup>1</sup>, Paola Stradolini da Silva<sup>1</sup>, Marcelo Gryczak<sup>1</sup>, Alice do Amaral Rodrigues<sup>1</sup>, Régis Henrique da Silva Souza<sup>1</sup>, Germano Lasch<sup>1</sup>, Liu Yesukai de Barros<sup>1</sup>, Patric Daniel Neis<sup>1</sup>, Cesar Liberato Petzhold<sup>1</sup>;  
<sup>1</sup>Universidade Federal do Rio Grande do Sul

**17:20 - T02-S14.3**

ID: 4EJJ

Oral presentation

**The effect of electric potentials on the initiation and progression of surface initiated rolling contact fatigue**

Benjamin Wainwright<sup>1</sup>, Thomas Welham<sup>1</sup>, Clive Hamer<sup>1</sup>, Yu Liu<sup>1</sup>; <sup>1</sup>PCS Instruments Ltd

**Friday, September 25****SESSION T02-S15**

09:30 – 10:50 • OCEANIA II

**Session Chair(s):** Bruna Zappelino Camillo**09:30 - T02-S15.1**

ID: 4EMX

Oral presentation

**A pathway to sustainable wear protection: Strengthened iron aluminide coatings omitting critical raw materials**

Harald Rojacz<sup>1</sup>, Markus Varga<sup>1</sup>, Stefan J Eder<sup>2,1</sup>; <sup>1</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>2</sup>Technische Universität Wien

**09:50 - T02-S15.2**

ID: 4EN6

Oral presentation

**Numerical and Experimental Results for Grooved Dry Gas Seals**

Pascal Jolly<sup>1</sup>, Noel Brunetiere<sup>1</sup>, Andriy Zahorulko<sup>2</sup>; <sup>1</sup>Institut Pprime, <sup>2</sup>Sumy State University



**10:10 - T02-S15.3**

ID: 4ENH

Oral presentation

**Effect on the plasticity of austenitic stainless steel 304L after ball-on-disc tribotesting in a hydrogen atmosphere**

Ana Cecilia Pontes Rodrigues<sup>1</sup>, Geraldine Theiler<sup>2,3</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>Federal Institute for Material research and Testing, <sup>3</sup>Federal Institute for Material Research and Testing

**10:30 - T02-S15.4**

ID: 4EXV

Oral presentation

**Friction and wear behaviour of fully bio-based nanocellulose composites**

Lucas Maximilian Kneissl<sup>1,2</sup>, Mitjan Kalin<sup>1</sup>, Nazanin Emami<sup>3,1</sup>; <sup>1</sup>University of Ljubljana, <sup>2</sup>Luleå University of Technology, <sup>3</sup>Lulea University of Technology / Luleå tekniska universitet

**SESSION T02-S16**

11:30 – 12:30 • OCEANIA II

Session Chair(s): T V V L N Rao

**11:30 - T02-S16.1**

ID: 4ESS

Oral presentation

**Experimental Evaluation of Structural Characteristics of a Hybrid Thrust Foil Bearing Using Metal and Viscoelastic Material**

MASAYUKI OCHIAI<sup>1</sup>; <sup>1</sup>Tokai University

**11:50 - T02-S16.2**

ID: 4ESX

Oral presentation

**Wear in Electrified Rolling-Sliding Contacts**

Ammad Yousuf<sup>1</sup>, Hugh A. Spikes<sup>2,1</sup>, Amir Kadiric<sup>2</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College

**12:10 - T02-S16.3**

ID: 4ET2

Oral presentation

**Tribological behavior of low viscosity synthetic ester base oils for Electric Vehicles under pure sliding electrified conditions**

CLAUDIA MARTÍNEZ DE CASTILLA<sup>1</sup>, BIHOTZ PINEDO<sup>1</sup>, EDUARDO TABARES<sup>1</sup>, VANESA ALONSO<sup>1</sup>, MARTA HERNÁIZ<sup>1</sup>, BORJA ARMENDARIZ<sup>1</sup>, AINARA LOPEZ<sup>1</sup>, JAVIER BARRIGA<sup>1</sup>; <sup>1</sup>Fundación Tekniker

**SESSION T02-S18**

11:30 – 12:30 • OCEANIA IX

Session Chair(s): Maria Cristina Moré Farias

**11:30 - T02-S18.1**

ID: 4EY2

Oral presentation

**Grease-lubricated hybrid rolling element bearings: friction torque and carbon footprint**

Gabriel Calderon-Salmeron<sup>1</sup>; <sup>1</sup>Royal Institute of Technology / Kungliga Tekniska Högskolan

**11:50 - T02-S18.2**

ID: 4EYT

Oral presentation

**Tribological Performance of Sustainable Biocomposite Brake Pads**

Julia Hummel Della Barba<sup>1</sup>, Lucas Kiyoji Matsubara<sup>1</sup>, Beatriz de Andrade Ornellas<sup>2</sup>, JANAINA FRACARO DE SOUZA GONÇALVES<sup>1</sup>, Bruna Zappelino Camillo<sup>2</sup>, Jeferson Trevisan Pacheco<sup>3</sup>, Anael Preman Krelling<sup>4</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Centro Universitário SENAI SC, <sup>3</sup>Senai Innovation Institute for Manufacturing System and Laser Processing, <sup>4</sup>Instituto Federal de Educação, Ciência e Tecnologia de Santa Catarina

**SESSION T02-S17**

14:00 – 16:00 • OCEANIA II

**Session Chair(s):** Lucia Vieira**14:00 - T02-S17.1**

ID: 4ETB

Oral presentation

**Development of Thixotropic Materials based Eco-friendly Lubricants**Arun Kumar<sup>1</sup>, Vivek Kumar<sup>1</sup>, Yogesh M. Joshi<sup>1</sup>, Manjesh Kumar Singh<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Kanpur**14:20 - T02-S17.2**

ID: 4EE4

Oral presentation

**Investigate the effect of the hydrogen barrier coating on the hydrogen permeation rate into steel**Ajay Pratap Singh Lodhi<sup>1</sup>, Alaaeddin Al Sheikh Omar<sup>1</sup>, Edward Vernon-Stroud<sup>1</sup>, Mitjan Kalin<sup>2</sup>, Ardian Morina<sup>1</sup>; <sup>1</sup>University of Leeds, <sup>2</sup>University of Ljubljana**14:40 - T02-S17.3**

ID: 4EV2

Oral presentation

**Plasma Nitriding of API X70 Steel for Hydrogen Transport Applications: Effects on embrittlement and tribological performance**Cris Maria Aureliano Marques Albuquerque<sup>1</sup>, Salete Martins Alves<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte**15:00 - T02-S17.4**

ID: 4EWB

Oral presentation

**Effects of Copper Oxide Nanoparticles Additives on the Lubricity of BiodieselFuel**Luiz Eduardo Gabriel da Costa<sup>1</sup>, DERYKY FLAVIO FERNANDES DA SILVA<sup>1</sup>, Salete Martins Alves<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte**15:20 - T02-S17.5**

ID: 4EPA

Oral presentation

**Avocado oil as a sustainable base for top-of-rail friction modifiers**Roman Nevshupa<sup>1</sup>, Juan Camilo Velez Molina<sup>1</sup>, Juan Felipe Santa Marín<sup>2</sup>, Alejandro Toro<sup>2</sup>; <sup>1</sup>CSIC, <sup>2</sup>Universidad Nacional de Colombia**15:40 - T02-S17.6**

ID: 4DWK

Oral presentation

**Sustainable Energy Transition for Sustainable Tribology: An Assessment using Machine Learning**Henara Lillian Costa<sup>1</sup>, Mitjan Kalin<sup>2</sup>, T V V L N Rao<sup>3</sup>; <sup>1</sup>Universidade Federal do Rio Grande, <sup>2</sup>University of Ljubljana, <sup>3</sup>MIT Art, Design and Technology University**SESSION T02-S19**

14:00 – 16:00 • OCEANIA IX

**Session Chair(s):** Felipe Kevin Correia Luz**14:00 - T02-S19.1**

ID: 4F4C

Oral presentation

**Functionalized Graphene-Derived Nano-additives as Solid Lubricants in UHMWPE composites**Antoine Foucault-Castelli<sup>1</sup>, Lucas Maximilian Kneissl<sup>2</sup>, Pablo Manuel Martínez Rubio<sup>1</sup>, Nazanin Emami<sup>1</sup>; <sup>1</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>2</sup>Luleå University of Technology**14:20 - T02-S19.2**

ID: 4F6P

Oral presentation

**Chemical analysis of the degradation of green lubricants in tribological tests**ALINE COZZA OLIVEIRA<sup>1</sup>, Daniele Gomes Muller<sup>1</sup>, Renato Luiz Siqueira<sup>2</sup>, Henara Lillian Costa<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande, <sup>2</sup>Universidade Federal do Rio de Janeiro

**14:40 - T02-S19.3**

ID: 4FB6

Oral presentation

**Tribological and mechanical performance of nano-SiO<sub>2</sub> reinforced 3D printed multiscale PEEK composites**Nazanin Emami<sup>1</sup>; <sup>1</sup>Luleå University of Technology**15:00 - T02-S19.5**

ID: 4EDR

Oral presentation

**On the effect of hydrogen absorption on wear behavior of steel 42CrMo4 in different microstructural states**Stefanie Hanke<sup>1</sup>, David Alejandro Diaz Yanez<sup>1</sup>, Morteza Abedini<sup>1</sup>; <sup>1</sup>Universität Duisburg Essen**15:20 - T02-S19.6**

ID: 4EMT

Oral presentation

**Effect of Clearances on Bush Rotation Speed and Oil Film: X-ray CT Visualization in Floating Bush Bearings**NATTAWAT NILAMANN<sup>1</sup>, MASAYUKI OCHIAI<sup>1</sup>; <sup>1</sup>Tokai University

## POSTER PRESENTATIONS

Wednesday, September 23

### SESSION Poster 03

10:50 – 11:30 • America

**03.1 ID: 4EXH - Analysis of wear modes in gaseous hydrogen network valves**ADILODERNE NOGUEIRA SOUZA FILHO<sup>1</sup>, Matheus Maciel G. Silva<sup>1</sup>, Juliane Ribeiro da Cruz<sup>1</sup>, Larissa Solano de Almeida<sup>1</sup>, Newton Kiyoshi Fukumasu<sup>1</sup>, Roberto Martins de Souza<sup>1</sup>; <sup>1</sup>Universidade de São Paulo**03.2 ID: 4F64 - Impact of Fretting on Electrical Steel Performance in Electrical Machines**Alessandro Augusto Olimpio Ferreira Vittorino<sup>1</sup>, Marcelo Braga dos Santos<sup>1</sup>, José Daniel Biasoli Mello<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia**03.3 ID: 4FAK - Tribological Behaviour of Thermally Sprayed Bronze / Rice Husk Ash Composite Coatings**ALINE COZZA OLIVEIRA<sup>1</sup>, Amanda Maack da Rocha Santejano<sup>1</sup>, Itailon Pereira Moreno<sup>1</sup>, Lenon Medina Ferreira<sup>1</sup>, Luan Radmann da Silva<sup>1</sup>, Sabrina Espinosa Cabreira<sup>1</sup>, Vinicius Acosta Pintanel<sup>1</sup>, Henara Lillian Costa<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande**03.4 ID: 4EZP - Use of a triboacoustic pin to monitor the formation of tribofilms in ethanol contaminated lubricants**Alvaro Santos Piovesan<sup>1</sup>, Henara Lillian Costa<sup>2</sup>, Fabio Tatzgern<sup>3</sup>; <sup>1</sup>Universidade Federal de Pelotas, <sup>2</sup>Universidade Federal do Rio Grande, <sup>3</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH**03.5 ID: 4EYD - Advanced Tribological Testing Machines at TEKNIKER**Amaya Igartua<sup>1</sup>, Borja Zabala<sup>1</sup>, Francesco Pagano<sup>1</sup>, Ichiro Minami<sup>1</sup>, BIHOTZ PINEDO<sup>1</sup>, Jose Maria Seara<sup>1</sup>, JAVIER BARRIGA<sup>1</sup>; <sup>1</sup>Fundación Tekniker**03.6 ID: 4EK4 - Wear and Fatigue Behavior of AM Stainless Steels Exposed to Hydrogen**Bojan Podgornik<sup>1</sup>, Marko Sedlaček<sup>1</sup>, Barbara Šetina Batič<sup>1</sup>, Irena Paulin<sup>1</sup>, Bojan Zajec<sup>2</sup>, Mirjam Bajt Leban<sup>2</sup>, Frantz Martin<sup>3</sup>; <sup>1</sup>Institute of Metals and Technology, <sup>2</sup>Sloveniana National Building and Civil Engineering Institute, <sup>3</sup>CEA-ISAS

**03.7 ID: 4FA2 - Influence of seed origin on *Moringa oleifera* oil properties**

Julia Hummel Della Barba<sup>1</sup>, JANAINA FRACARO DE SOUZA GONÇALVES<sup>1</sup>, Bruna Zappelino Camillo<sup>2</sup>, Beatriz de Andrade Ornellas<sup>2</sup>, Yaskara Fabiola de Monteiro Marques Leite<sup>3</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Centro Universitário SENAI SC, <sup>3</sup>Universidade do Estado do Rio Grande do Norte

**03.8 ID: 4EEF - From Tribological Loss Reduction to System-Level Energy Efficiency: Implications for Industrial Cogeneration Systems**

CESAR AUGUSTO FRANCISCO DA SILVA<sup>1,2</sup>, Christian Davidson Santos Costa<sup>1</sup>, Claudia Assunção Gonçalves Chaves<sup>1</sup>, Felipe Raul Ponce Arrieta<sup>1</sup>, Gilmar Cordeiro da Silva<sup>1</sup>; <sup>1</sup>Pontifícia Universidade Católica de Minas Gerais, <sup>2</sup>Universidade Federal de Minas Gerais

**03.9 ID: 4EVE - Effect of Reduced Graphene Oxide nanoparticles on performance of Gearbox Lubrication Systems**

DERYKY FLAVIO FERNANDES DA SILVA<sup>1</sup>, Salete Martins Alves<sup>1</sup>, Maycon Guilherme Azevedo De Lima<sup>1</sup>, Lucas Costa de Araújo<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte

**03.10 ID: 4DSC - Performance of SiC/YAG Coatings in Steam-Rich and Ash Environments**

Franciele Dias de Castro<sup>1</sup>, Nathan Fantecelle Strey<sup>2</sup>, Matheus da Silva Pinto<sup>3</sup>, Andre Renan Mayer<sup>3</sup>, Pantcho Stoyanov<sup>3</sup>, Henara Lillian Costa<sup>4</sup>; <sup>1</sup>Universidade Federal de Pelotas, <sup>2</sup>Universidade Federal do Espírito Santo, <sup>3</sup>Concordia University, <sup>4</sup>Universidade Federal do Rio Grande

**03.11 ID: 4EGB - Green tribology promoting social, racial and gender equality in the STEMs**

Hellen Thayana Silva Moreira<sup>1</sup>, Tito Sant Anna Cadaval Jr.<sup>1</sup>, Felipe Kessler<sup>1</sup>, Henara Lillian Costa<sup>1</sup>, Rodrigo Jorge Macedo<sup>2</sup>, Anderson Favero Porte<sup>2</sup>; <sup>1</sup>Universidade Federal do Rio Grande, <sup>2</sup>Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul

**03.12 ID: 4EPG - Aqueous superlubricity of a SiC-coated stainless steel sliding against Si3N4**

João Vitor Raimundo Silva e Silva<sup>1</sup>, Mateus Imperial Girelli<sup>1</sup>, Franciele Dias de Castro<sup>2</sup>, Henara Lillian Costa<sup>3</sup>, Cherlio Scandian<sup>1</sup>, Nathan Fantecelle Strey<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>Universidade Federal de Pelotas, <sup>3</sup>Universidade Federal do Rio Grande

**03.13 ID: 4EA6 - Electro-tribological and electrical properties of PAO based lubricants with ZDDP and CNT additives**

Andys Hernandez Peña<sup>1</sup>, Juan Pablo Abdelnabe<sup>2</sup>, German Prieto<sup>2</sup>, Walter Roberto Tuckart<sup>2</sup>, Leonardo Israel Farfan Cabrera<sup>1</sup>; <sup>1</sup>Tecnológico de Monterrey, <sup>2</sup>Universidad Nacional del Sur

**03.14 ID: 4ETK - TriboGirls Project: Biofuels for a Sustainable World**

Lorena Rocha Gabriel<sup>1</sup>, LAURA GABRIELLY DA SILVA COSTA<sup>2</sup>, LUANNY KEMILLY DA SILVA HONORATO<sup>2</sup>, MARIA BEATRIZ DE SOUZA SILVA FAUSTINO<sup>2</sup>, MARIA LUIZA DE SOUZA CARDOSO<sup>2</sup>, MAYRA KAROLINY DE SÁ ALVES<sup>2</sup>, SHAYLLA NAYONARA SILVA FIGUEIREDO<sup>2</sup>, Salete Martins Alves<sup>1</sup>, Tawanna Silvestre Araújo da Silva<sup>2</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte, <sup>2</sup>Escola Estadual Edgar Barbosa

**03.15 ID: 4DVH - Tribological Insight into Aggregate Selection for Pavement Skid Resistance Using the Aggregate Hardness Parameter**

Malal Kane<sup>1</sup>; <sup>1</sup>Gustave Eiffel University

**03.16 ID: 4ECZ - Thermophysical and Tribological Properties of Sustainable Lubricant Formulations Based on Synthetic Bases and Recycled Vegetable Oils**

María Jesús García Guimarey<sup>1</sup>, Andrea Grille Silva<sup>1</sup>, Lucía Sánchez Martínez<sup>1</sup>, María José Pérez Comuñas<sup>1</sup>;

<sup>1</sup>Universidade de Santiago de Compostela

**03.17 ID: 4FAM - Divergencies in bio-lubrication: academic outputs versus IP abandonment ratios**

Matheus Hromatka<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**03.18 ID: 4EFN - Sustainable superlubricity: a festival powered by nature**

Paul-marie Zubieta-Laborde<sup>1</sup>, Graham L.W. Cross<sup>2</sup>, Frédéric Dubreuil<sup>1</sup>, Maria Isabel De Barros Bouchet<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>Trinity College University of Dublin

**03.19 ID: 4FDN - Unraveling Fretting Wear Mechanisms of AISI 52100 Steel in Electrified Vehicle Tribosystems**

Mohamed Kamal Ahmed Ali<sup>1</sup>, Qiangliang Yu<sup>1</sup>, Bin Li<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**03.20 ID: 4E22 - Tribological Characterization of a Water-Based Lubricated Ball Bearing under an Electric Field**

Siyu Wang<sup>1</sup>, Reza Najjari<sup>2</sup>, Mahdi Mohammadpour<sup>1</sup>, Tom Slatter<sup>1</sup>, Stephanos Theodossiades<sup>1</sup>, Jonny Hansen<sup>3</sup>; <sup>1</sup>Loughborough University, <sup>2</sup>Loughbrough university, <sup>3</sup>TRATON Group

**03.21 ID: 4FAD - Reciprocating sliding wear of carbon fiber reinforced PEEK**

Patrick Mothé Ferreira<sup>1</sup>, João Vitor Raimundo Silva e Silva<sup>1</sup>, Rubson Mação Camporez<sup>2</sup>, Cherlio Scandian<sup>1</sup>, Nathan Fantecelle Strey<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO

**03.22 ID: 4FBW - FR202 – A new proprietary renewable Organic Friction Reducer**

Simone Verga<sup>1</sup>, Marcello Notari<sup>1</sup>, Massimo Manni<sup>1</sup>, Giulio Assanelli<sup>1</sup>; <sup>1</sup>Eni S.p.A.

**03.23 ID: 4F2G - Design and Application of a Novel Tribo-Electrochemical Cell for In-Situ Hydrogenation Studies**

Gregory Favaro<sup>1</sup>, Philippe KEMPE<sup>2</sup>, Yakob Samanes Kruijer<sup>3</sup>, Stefano Mischler<sup>3</sup>, Anna Neus Igual-Muñoz<sup>3</sup>, Tushar Khosla<sup>2</sup>; <sup>1</sup>Rtec-Instruments Inc., <sup>2</sup>Rtec Instruments Inc., <sup>3</sup>École Polytechnique Fédérale de Lausanne

## TRACK 03

### Surface Metrology and Contact Mechanics

## ORAL PRESENTATIONS

**Monday, September 21**

**SESSION T03-S01**

14:40 – 16:00 • OCEANIA-VIII

**Session Chair(s):** Roberto Martins de Souza**14:55 - T03-S01.1**

ID: 4EBF

Invited Speaker

**Active Bio-Contact Mechanics and Regenerative Rehabilitation of Osteoarthritic Joints**Valentin L. Popov<sup>1,2</sup>, Jean-Emmanuel Leroy<sup>2</sup>, Jasminka Starcevic<sup>2</sup>, Rustam Ibragimovich Khalmuradov<sup>3</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Technische Universität Berlin, <sup>3</sup>Samarkand State University**15:20 - T03-S01.2**

ID: 4DNP

Oral presentation

**Linking Current Density to Wettability and Tribological Properties of Anodized 5083-Aluminum Alloys**Mohamed Abid<sup>1</sup>, Abdelghani Ait Lahcen<sup>1</sup>, Bouchra Hassoune-Rhabbour<sup>1</sup>; <sup>1</sup>Université de Technologie de Tarbes**15:40 - T03-S01.3**

ID: 4DTJ

Oral presentation

**Efficient characterization of extreme pressure properties of lubricants using advanced 4-ball test methodology**Mathias woydt<sup>1</sup>, Tushar Khosla<sup>2</sup>, Krishnamurti Singh<sup>2</sup>; <sup>1</sup>MATRILUB, <sup>2</sup>Rtec Instruments Inc.**SESSION T03-S02**

16:40 – 17:40 • OCEANIA-VIII

**Session Chair(s):** Roberto Martins de Souza**16:40 - T03-S02.1**

ID: 4DWN

Oral presentation

**Multimode Visible Optical Force Microscopy for Characterization of Two-Dimensional Materials and Nano Through-Silicon Vias**Xinfeng Tan<sup>1</sup>; <sup>1</sup>Tsinghua University**17:00 - T03-S02.2**

ID: 4DZB

Oral presentation

**The  $\Lambda^*$ -ratio for circular EHL contacts: robustness, sensitivity, and validity**Jonny Hansen<sup>1,2</sup>, Deepak K. Prajapati<sup>1</sup>, Marcus Björling<sup>1</sup>, Roland Larsson<sup>1</sup>; <sup>1</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>2</sup>TRATON Group**17:20 - T03-S02.3**

ID: 4E2E

Oral presentation

**Analyzing an entire scratch cross-sectionally in a TiN film**Guizhi Wu<sup>1</sup>, Peng Wang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences**Tuesday, September 22****SESSION T03-S03**

09:30 – 10:50 • OCEANIA-VIII

**Session Chair(s):** Noel Brunetiere**09:40 - T03-S03.1**

ID: 4FD6

Keynote Speaker

**Advancing the Characterization of Surfaces: The Surface-Topography Challenge Continues**Tevis Jacobs<sup>1</sup>; <sup>1</sup>University of Pittsburgh

**10:10 - T03-S03.2**

ID: 4EAR

Oral presentation

**A Review of Asperity Persistence, Fully Plastic Real Contact Pressure and Hardness**Robert L. Jackson<sup>1</sup>, Santosh Angadi<sup>2</sup>; <sup>1</sup>Auburn University, <sup>2</sup>CMR University**10:30 - T03-S03.3**

ID: 4EAY

Oral presentation

**Can we trust optical profilometry for tribofilm topography measurements? A polymer transfer film case study**Kian Kun Yap<sup>1</sup>, Sergey Shevchik<sup>2</sup>, Lucas Amspacher<sup>3</sup>, Chao Wang<sup>4</sup>, Weixuan Lv<sup>4</sup>, Marc Masen<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Swiss Federal Laboratories for Materials Science and Technology, <sup>3</sup>DuPont, <sup>4</sup>Lanzhou Institute of Chemical Physics**SESSION T03-S04**

11:30 – 12:30 • OCEANIA-VIII

**Session Chair(s):** Noel Brunetiere**11:30 - T03-S04.1**

ID: 4EC4

Oral presentation

**Applying Persson's model for manufacturing metal-polymer bonded contacts**Heloísa Colli Moreira<sup>1</sup>, Giuseppe Pintaude<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná**11:50 - T03-S04.2**

ID: 4E4M

Oral presentation

**Angle-Resolved and Feature-Based Approaches to Surface Texture Analysis - A Correlation Study**Matthias Eifler<sup>1</sup>, Alexander Müller<sup>2</sup>, Boris Brodmann<sup>3</sup>, Jörg Seewig<sup>2</sup>; <sup>1</sup>IU International University of Applied Sciences, <sup>2</sup>RPTU University Kaiserslautern-Landau, <sup>3</sup>OptoSurf GmbH**12:10 - T03-S04.3**

ID: 4ECV

Oral presentation

**Triboinformatics: Topological Data Analysis for rough surfaces**Michael Nosonovsky<sup>1</sup>, Aleksandr S. Aglikov<sup>2</sup>, Mikhail V. Zhukov<sup>2</sup>, Ekaterina V. Skorb<sup>2</sup>; <sup>1</sup>University of Wisconsin-Milwaukee, <sup>2</sup>ITMO University**SESSION PJA02**

14:00 – 14:40 • EUROPA III-IV

**Session Chair(s):** Mitjan Kalin**14:00 - PJA02.1**

ID: 4FCM

Peter Jost Award

**How Surface Topography and Chemistry Control Lubrication**Juliette CAYER-BARRIOZ<sup>1</sup>; <sup>1</sup>Ecole Centrale de Lyon**SESSION T03-S05**

14:40 – 16:00 • OCEANIA-VIII

**Session Chair(s):** Valentin L. Popov**14:40 - T03-S05.1**

ID: 4EDK

Oral presentation

**Effect of pigment volume concentration on scratch resistance of polyurethane and polyester coil coatings paint.**Nicolas Mille<sup>1</sup>, Marina Pecora<sup>1</sup>, Thibaud Metivier<sup>2</sup>, Didier Verchere<sup>2</sup>, GAUTHIER, Christian<sup>1</sup>; <sup>1</sup>Université de Strasbourg, <sup>2</sup>Centre de recherche des matériaux

**15:00 - T03-S05.2**

ID: 4EGN

Oral presentation

**Theoretical and experimental study of the roughness effect in normal contact of deformable bodies**Irina Goryacheva<sup>1</sup>, Anastasiya Yakovenko<sup>1</sup>, Pavel Bukovskii<sup>1</sup>; <sup>1</sup>Ishlinsky Institute for Problems in Mechanics RAS**15:20 - T03-S05.3**

ID: 4EKF

Oral presentation

**Friction reduction of paraffin-based mineral oils in low-temperature environments**mori daichi<sup>1</sup>, Noritsugu Umehara<sup>1</sup>, Takayuki Tokoroyama<sup>1</sup>; <sup>1</sup>Nagoya University**15:40 - T03-S05.4**

ID: 4F4E

Oral presentation

**Sliding contact temperature determination using acicular grindable thermocouple and inverse heat conduction**Oleksii Nosko<sup>1</sup>, Yurii Tsybrii<sup>1</sup>; <sup>1</sup>Gdansk University of Technology / Politechnika Gdanska**SESSION T03-S06**

16:40 – 17:40 • OCEANIA-VIII

**Session Chair(s):** Francisco José Profito**16:40 - T03-S06.1**

ID: 4ENY

Oral presentation

**Effect of non-stationary frictional heating on contact of viscoelastic coatings**Elena Torskaya<sup>1</sup>, Fedor Stepanov<sup>1</sup>; <sup>1</sup>Ishlinsky Institute for Problems in Mechanics RAS**17:00 - T03-S06.2**

ID: 4ENZ

Oral presentation

**Mechanics-Driven Design of Patterned Steel Floor Plates for Enhanced Slip Resistance and Fatigue Durability**Lingqi Qian<sup>1</sup>, Bin Xiao<sup>2</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Tata Steel UK**17:20 - T03-S06.3**

ID: 4ESY

Oral presentation

**In-situ measurement of ultra-thin lubricant films under extreme loads in large water-lubricated graphite bearings**Pan Dou<sup>1,2</sup>, Quanzhong Wu<sup>1</sup>, Tonghai Wu<sup>1</sup>, Thomas Reddyhoff<sup>2</sup>; <sup>1</sup>Xi'an Jiaotong University, <sup>2</sup>Imperial College London**Wednesday, September 23****SESSION T03-S07**

09:30 – 10:50 • OCEANIA-VIII

**Session Chair(s):** Roberto Martins de Souza**09:45 - T03-S07.1**

ID: 4FDA

Invited Speaker

**Invited talk - Mohamed EL Mansori**Mohamed EL MANSORI<sup>1</sup>; <sup>1</sup>École Nationale Supérieure des Arts et Métiers**10:10 - T03-S07.2**

ID: 4EXK

Oral presentation

**Effect of Surface Roughness on Scuffing Damage in Rolling-Sliding Contacts**Oliver Fazzino<sup>1</sup>, Ali Ghanbarzadeh<sup>2</sup>, Amir Kadiric<sup>3,1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Jaguar Land Rover, <sup>3</sup>Imperial College



**10:30 - T03-S07.3**

ID: 4F6E

Oral presentation

**Partial Slip in Tangential Contact of an Elastic Quarter-Space**Qiang Li<sup>1</sup>; <sup>1</sup>Technische Universität Berlin**SESSION T03-S08**

11:30 – 12:30 • OCEANIA-VIII

**Session Chair(s):** Roberto Martins de Souza**11:30 - T03-S08.1**

ID: 4EXR

Oral presentation

**A Probabilistic Metrological Framework Linking Surface Topography Transition to Functional Tribological Performance**Wieslaw Antoni Grabon<sup>1</sup>, Adilson Rodrigues da Costa<sup>2</sup>, Grochalski Karol<sup>3</sup>, Gilmar Ferreira Batalha<sup>4</sup>, <sup>1</sup>Rzeszow University of Technology, <sup>2</sup>Universidade Federal de Ouro Preto, <sup>3</sup>Poznan University of Technology, <sup>4</sup>Universidade de São Paulo**11:50 - T03-S08.2**

ID: 4EYF

Oral presentation

**Rare-earth-based luminescent sensors for tribological applications**Theophile Vie<sup>1</sup>, Yujiao Zhou<sup>1,2</sup>, Laurence Bois<sup>2</sup>, Descartes<sup>3</sup>, Gilles Ledoux<sup>4</sup>, David Philippon<sup>1</sup>; <sup>1</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>2</sup>Laboratoire des Multimatériaux et Interfaces, <sup>3</sup>Institut national des Science Appliquées de Lyon, <sup>4</sup>Institut Lumière Matière**POSTER PRESENTATIONS****Tuesday, September 22****SESSION Poster 01**

10:50 – 11:30 • America

**01.44 ID: 4E2D - Study on the relationship between viscosity, wear debris, and lubrication regimes under three-body lubricated conditions**Jeng Haur Horng<sup>1</sup>, Yang Yuan Chen<sup>2</sup>, Wen Hsien Kao<sup>3</sup>, Jin Long Lin<sup>2</sup>; <sup>1</sup>National Cheng Kung University, <sup>2</sup>National Formosa University, <sup>3</sup>Chienkuo Technology University**Thursday, September 24****SESSION Poster 05**

10:50 – 11:30 • America

**05.1 ID: 4FBZ - An experimental approach for quantifying the mechanical strength of fretting-induced adhesion junctions**Amirhossein Zabihi<sup>1</sup>, Jouko Hintikka<sup>2</sup>, Antti Mäntylä<sup>2</sup>, Joona Vaara<sup>2</sup>, Tero Frondelius<sup>2</sup>, Janne Juoksukangas<sup>1</sup>; <sup>1</sup>Tampere University, <sup>2</sup>Wärtsilä

**05.2 ID: 4ECF - 3BolmPro: 3rd Body Image Processing, an image processing tool dedicated to third body analysis in tribology**

Bouchot Alizée<sup>1,2</sup>, Matiss Bitar-Vachet<sup>3</sup>, Mathys Fernandez<sup>4</sup>, Guilhem Mollon<sup>1</sup>, Descartes<sup>2</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>3</sup>Institution Lamartine, Collège & Lycées, <sup>4</sup>Université Claude Bernard Lyon 1

**05.3 ID: 4F2B - Summit-counting method for statistical prediction of the coefficient of friction under mixed EHL conditions**

Carlos M.C.G. Fernandes<sup>1</sup>, Miguel Dias<sup>1</sup>; <sup>1</sup>Universidade do Porto

**05.4 ID: 4EKE - Surface Metrology as an Indirect Descriptor of Two-Body Abrasive Response in Steels and Gray Cast Iron under Standardized Manual Grinding**

Débora Vitória de Freitas Leal dos Santos<sup>1</sup>, Vanessa Kapps<sup>1</sup>, MARCIA MARIE MARU<sup>1</sup>; <sup>1</sup>National Institute of Metrology, Quality and Technology

**05.5 ID: 4EBY - Analysis of skewness ( $R_{sk}$ ) and kurtosis ( $R_{ku}$ ) parameters and diameter and cylindricity deviations in the dry drilling of Al-Mg-Si 6351-T6 alloy**

Elhadji Cheikh Talibouya Ba<sup>1</sup>, Marcus Vinícius de Oliveira<sup>1</sup>, JOSENILTON DOS SANTOS LOPES<sup>1</sup>, Mayara Fernanda Pereira<sup>1</sup>, Éder Silva Costa<sup>1</sup>, Paulo Sérgio Martins<sup>2</sup>, Márcio Bacci da Silva<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia, <sup>2</sup>Faculdade Ibmecc

**05.6 ID: 4F6D - The Influence of Volume Conservation on the Stiffness of DC01 Steel Surfaces Under Large Deformations**

Elton Yvens Godoy de Oliveira<sup>1</sup>, Ainhoa Guinea<sup>2</sup>, Alaitz Zabala<sup>2</sup>, Francisco José Profito<sup>3</sup>, Henara Lillian Costa<sup>4</sup>; <sup>1</sup>Universidade Federal de Pelotas, <sup>2</sup>Universidad de Mondragon Mondragon Unibertsitatea, <sup>3</sup>Universidade de São Paulo, <sup>4</sup>Universidade Federal do Rio Grande

**05.7 ID: 4EPK - Tribological Evaluation of Skin-Textile Contact under Different Counterbody Geometries**

JOSE GUADALUPE SALINAS CABRERA<sup>1</sup>, Flavio A. Domínguez Pacheco<sup>2</sup>, Ezequiel A. Gallardo-Hernández<sup>1</sup>; <sup>1</sup>Instituto Politécnico Nacional, <sup>2</sup>INSTITUTO NACIONAL POLITECNICO

**05.8 ID: 4EJZ - Tribometrological Ranking of Dental Resin Composites After Simulated Clinical Polishing Based on Functional Roughness Parameters**

Wuislane Lúcia Ribeiro Souza<sup>1</sup>, Vanessa Kapps<sup>2</sup>, MARCIA MARIE MARU<sup>2</sup>, CESAR DOS REIS PEREZ<sup>1</sup>; <sup>1</sup>Universidade do Estado do Rio de Janeiro, <sup>2</sup>National Institute of Metrology, Quality and Technology

**05.9 ID: 4EWF - Surface integrity assessment of additively manufactured 316L after grinding**

Marcus Vinícius de Oliveira<sup>1</sup>, JOSENILTON DOS SANTOS LOPES<sup>1</sup>, Mark James Jackson<sup>2</sup>, Rosemar Batista da Silva<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia, <sup>2</sup>University of Cambridge

**05.10 ID: 4EVV - Surface Texture and Wear Behavior of a Zr-Modified AISi5Cu2Mg Aluminum Alloy under Lubricated Sliding Conditions**

Monika Madej<sup>1</sup>, Magdalena Niemczewska-Wójcik<sup>2</sup>, Dana Bolibruchová<sup>3</sup>; <sup>1</sup>Kielce University of Technology, <sup>2</sup>Cracow University of Technology, <sup>3</sup>University of Žilina

**05.11 ID: 4EC6 - AI-Assisted Metrology of Adhesive Wear in UHMWPE and Its Correlation with Friction**

Raphael dos Santos Machado Chaves<sup>1</sup>, Vanessa Kapps<sup>1</sup>, MARCIA MARIE MARU<sup>1</sup>, Charles Bezerra Prado<sup>1</sup>; <sup>1</sup>National Institute of Metrology, Quality and Technology

**05.12 ID: 4EFM - Spectral Analysis of Micromilled Surface Roughness**

Thaise Alonso<sup>1</sup>, JOSENILTON DOS SANTOS LOPES<sup>1</sup>, Milla Caroline Gomes<sup>2</sup>, Márcio Bacci da Silva<sup>1</sup>;

<sup>1</sup>Universidade Federal de Uberlândia, <sup>2</sup>Universidade Estadual de Campinas

**05.13 ID: 4EJT - Scratch-Based Ranking of UHMWPE Grades and Its Relation to Viscoelastic and Cyclic Contact Response**

Vanessa Kapps<sup>1</sup>, Alexander Martins da Silva<sup>1</sup>, Jorge Trota Filho<sup>1</sup>, MARCIA MARIE MARU<sup>1</sup>; <sup>1</sup>National Institute of Metrology, Quality and Technology

**05.14 ID: 4DRN - Metrological Reliability of In-Situ Penetration Depth in Scratch Testing of Biomedical Polymers: Effects of Device Compliance and Indenter Geometry**

Vanessa Kapps<sup>1</sup>, Jorge Trota Filho<sup>1</sup>, Gustavo Henrique Bispo Dias<sup>2</sup>, MARCIA MARIE MARU<sup>1</sup>; <sup>1</sup>National Institute of Metrology, Quality and Technology, <sup>2</sup>Anton Paar Brasil

**05.15 ID: 4DTN - New methodology to assess the slip-rolling fatigue resistance of materials and thin film coatings in an oscillating benchtop tribometer**

Vishal Khosla<sup>1</sup>, Mathias woydt<sup>2</sup>; <sup>1</sup>Rtec Instruments Inc., <sup>2</sup>MATRILUB

## TRACK 04

### Nanoscale Mechanisms of Friction and Lubrication

## ORAL PRESENTATIONS

**Monday, September 21**

**SESSION T04-S01**

14:40 – 16:00 • OCEANIA VII

**Session Chair(s):** Martin Dienwiebel

**14:55 - T04-S01.1 ID: 4FAG Invited Speaker****Hydration Superlubricity: The Mechanism and Application**

Chenhui Zhang<sup>1</sup>; <sup>1</sup>Tsinghua University

**15:20 - T04-S01.2 ID: 4DME Oral presentation****Hydrated Ions and Hydration Superlubricity**

Tianyi Han<sup>1</sup>, Xavier Banquy<sup>2</sup>, Chenhui Zhang<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University China, <sup>2</sup>Université de Montreal

**15:40 - T04-S01.3**

ID: 4DQB

Oral presentation

**Study on Friction Mechanism and Application of Nano-TiO<sub>2</sub> Additive with Different Structures under Extreme Working Conditions**

Kai Zeng<sup>1</sup>, Sixuan Fan<sup>1</sup>, Rong QU<sup>1</sup>, Xuechao Song<sup>1</sup>, Wenjing Hu<sup>1</sup>, Jiusheng LI<sup>1</sup>; <sup>1</sup>Shanghai Advanced Research Institute, Chinese Academy of Sciences

**SESSION T04-S02**

16:40 – 17:40 • OCEANIA VII

**Session Chair(s):** Martin Dienwiebel**16:40 - T04-S02.1**

ID: 4DNR

Oral presentation

**Carbon Dot-based Ionic Liquids: A Novel Additive for Lubrication and Corrosion Inhibition Application**

Haocheng Wang<sup>1</sup>, Songwei Zhang<sup>1</sup>, Litian Hu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**17:00 - T04-S02.2**

ID: 4DPM

Oral presentation

**Projection-based Hyper Reduction for the Full-System Finite Element Solution of the Mixed Thermal Elastohydrodynamic Lubrication Line Contact Problem**

Alain El Hajj<sup>1</sup>, Wassim Habchi<sup>2</sup>, Chady Ghnatios<sup>3</sup>, Philippe Lorong<sup>1</sup>, Francisco Chinesta<sup>1</sup>; <sup>1</sup>École Nationale Supérieure des Arts et Métiers, <sup>2</sup>Lebanese American University, <sup>3</sup>University of North Florida

**17:20 - T04-S02.3**

ID: 4DPT

Oral presentation

**Direct Observation and Quantification of the Lubrication Mechanism of Metal Disulfide Nanoparticles by In Situ TEM Nano-Friction Tests**

Fabrice Dassenoy<sup>1</sup>; <sup>1</sup>École Centrale de Lyon

**Tuesday, September 22****SESSION T04-S03**

09:30 – 10:50 • OCEANIA VII

**Session Chair(s):** Thomas Reichenbach**09:45 - T04-S03.1**

ID: 4EQA

Invited Speaker

**Multiscale modeling of capillary adhesion and friction**

Lars Pastewka<sup>1</sup>, Lennard Holschuh<sup>1</sup>, Yizhen Wang<sup>1</sup>, Luciano Sciaraffia<sup>1</sup>, Patrick Dondl<sup>1</sup>; <sup>1</sup>Universität Freiburg

**10:10 - T04-S03.2**

ID: 4DSG

Oral presentation

**Fracture Initiation and Crack Propagation in Linear Viscoelastic Materials**

Giuseppe Carbone<sup>1,2</sup>, Cosimo Mantriota<sup>2</sup>, Nicola Menga<sup>2</sup>; <sup>1</sup>Nanjing University of Science & Technology, <sup>2</sup>Politecnico di Bari

**10:30 - T04-S03.3**

ID: 4DVF

Oral presentation

**Ultrafast dynamics of electronic friction energy dissipation in defective semiconductor monolayer**

Huan Liu<sup>1</sup>; <sup>1</sup>Tsinghua University

**SESSION T04-S04**

11:30 – 12:30 • OCEANIA VII

**Session Chair(s):** Michael Moseler**11:50 - T04-S04.2**

ID: 4DXS

Oral presentation

**Structure and Superlubricity Mechanism of Confined Hydrated Ions**Yutong Li<sup>1</sup>, Tianyi Han<sup>2</sup>, Chenhui Zhang<sup>2</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Tsinghua University China**12:10 - T04-S04.3**

ID: 4DXY

Oral presentation

**Phase Transition Structural Superlubricity**Bao Jin<sup>1,2</sup>, Yongyong He<sup>2</sup>, Jianbin Luo<sup>2</sup>; <sup>1</sup>University of Cambridge, <sup>2</sup>Tsinghua University**SESSION T04-S05**

14:40 – 16:00 • OCEANIA VII

**Session Chair(s):** Fabrice Dassenoy**14:50 - T04-S05.1**

ID: 4FDB

Keynote Speaker

**To roll or not to roll? This is the question (at least for microparticles)**Lucio Isa<sup>1</sup>; <sup>1</sup>Swiss Federal Institute of Technology / Eidgenössische Technische Hochschule ETH Zürich**15:20 - T04-S05.2**

ID: 4F2H

Oral presentation

**Surface Tension Effect in Nano-Indentation of Soft Materials**NOEL<sup>1</sup>, BROGLY Maurice<sup>2</sup>, BISTAC, Sophie<sup>2</sup>, PRIEUR, Luc<sup>3</sup>, BUGAUT, Mathieu<sup>2</sup>, LUKES, Jaroslav<sup>4</sup>, FOND, Christophe<sup>3</sup>, Anh Dung Nguyen<sup>5</sup>; <sup>1</sup>Université du Maine le Mans Laval, <sup>2</sup>Université de Haute Alsace, LPIM, <sup>3</sup>Université de Strasbourg, <sup>4</sup>Bruker Nano Surfaces and Metrology, <sup>5</sup>Hanoi University of Industry**15:40 - T04-S05.3**

ID: 4E2A

Oral presentation

**Surface Polarity Dominates Hydration Lubrication via Interfacial Ion Configuration in the Helmholtz Plane**Jie Han<sup>1</sup>, Zhuolin Wu<sup>1</sup>, Yutong Li<sup>1</sup>, Tianyi Han<sup>2</sup>, Chenhui Zhang<sup>2</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Tsinghua University China**SESSION T04-S06**

16:40 – 17:40 • OCEANIA VII

**Session Chair(s):** Matteo Delli Colli**16:40 - T04-S06.1**

ID: 4DM4

Oral presentation

**Structural Superlubricity: Why and How Does It Work under Ambient Conditions?**Wai H. Oo<sup>1</sup>, Hongyu Gao<sup>2</sup>, Martin H. Müser<sup>2</sup>, Mehmet Baykara<sup>1</sup>; <sup>1</sup>University of California Merced, <sup>2</sup>Universität des Saarlandes**17:00 - T04-S06.2**

ID: 4EA4

Oral presentation

**Crystallinity-Dependent Tribological Behavior of Molybdenum Disulfide: Insights from Experiments and Atomistic Simulations**Abhiram B R<sup>1</sup>, Yue Wang<sup>1</sup>, Ilia Ponomarev<sup>1</sup>, Tomas Polcar<sup>1,2</sup>; <sup>1</sup>Czech Technical University, <sup>2</sup>University of Southampton

**17:20 - T04-S06.3**

ID: 4EB6

Oral presentation

**Submicron scale asperity strain hardening**Mark Kuzman<sup>1</sup>, Mitjan Kalin<sup>2</sup>; <sup>1</sup>Univerza v Ljubljani, <sup>2</sup>University of Ljubljana**Wednesday, September 23****SESSION T04-S07**

09:30 – 10:50 • OCEANIA VII

**Session Chair(s):** Michael Moseler**09:40 - T04-S07.1**

ID: 4DTB

Keynote Speaker

**Self-lubrication vs. plasticity: MD perspectives on ice and rock friction**Martin H. Müser<sup>1</sup>, Sergey V Sukhomlinov<sup>1</sup>; <sup>1</sup>Universität des Saarlandes**10:10 - T04-S07.2**

ID: 4EDJ

Oral presentation

**Vacuum Thermal Treatment for Achieving Superlubricity by Nanodiamond and Hexagonal Boron Nitride on H-DLC Film Surfaces in Dry Nitrogen**HuangPeng<sup>1,2</sup>; <sup>1</sup>Guizhou University (Institute of Technology), <sup>2</sup>Tsinghua University**10:30 - T04-S07.3**

ID: 4EDW

Oral presentation

**Disordered Water Molecule Structure Enhances Interfacial Slip**Tongyu Pan<sup>1</sup>, Liran Ma<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University**SESSION T04-S08**

11:30 – 12:30 • OCEANIA VII

**Session Chair(s):** Lars Pastewka**11:30 - T04-S08.1**

ID: 4EEP

Oral presentation

**EHD model with lubricant slip on slower and faster surface**Rayan Ajeeb<sup>1</sup>, Tomaž Požar<sup>1</sup>, Marko Polajnar<sup>1</sup>, Mitjan Kalin<sup>1</sup>; <sup>1</sup>University of Ljubljana**11:50 - T04-S08.2**

ID: 4EFS

Oral presentation

**FrictionSim2D: A High-Throughput Molecular Simulation Framework to Screen the Friction Performance of Two-Dimensional Materials**Matteo Valderrama<sup>1</sup>, James P. Ewen<sup>2,1</sup>, Nicolas Fillot<sup>3</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Bath, <sup>3</sup>Institut national des Science Appliquées de Lyon**12:10 - T04-S08.3**

ID: 4EFV

Oral presentation

**Atomic-scale mechanisms behind macroscopic superlubricity in plain bearings: the case of glycerol-lubricated ta-C and Si<sub>3</sub>N<sub>4</sub>**Thomas Reichenbach<sup>1</sup>, Takuya Kuwahara<sup>2</sup>, Gianpietro Moras<sup>1</sup>, Michael Moseler<sup>1</sup>; <sup>1</sup>Fraunhofer Institute for Mechanics of Materials, <sup>2</sup>Osaka Metropolitan University

**SESSION T04-S09**

14:40 – 16:00 • OCEANIA VII

**Session Chair(s):** Philip Egberts**14:55 - T04-S09.1**

ID: 4EPY

Invited Speaker

**Strain-Mediated Topography–Chemistry Coupling in Atomic-Scale Friction: Insights from Graphene Step Edges**Seong H. Kim<sup>1</sup>, Zhe Chen<sup>2</sup>; <sup>1</sup>Pennsylvania State University, <sup>2</sup>Zhejiang University**15:20 - T04-S09.2**

ID: 4EHX

Oral presentation

**Competing Cavitation and Chain Scission Drive Delayed Fracture in Viscoelastic Solids**Giuseppe Carbone<sup>1,2</sup>, Yigeng Peng<sup>1</sup>; <sup>1</sup>Nanjing University of Science & Technology, <sup>2</sup>Politecnico di Bari**15:40 - T04-S09.3**

ID: 4EJA

Oral presentation

**Concentration-Driven Conformational Transitions in Adsorbed Polymer Films Govern Tribological Behavior**Yuxi Song<sup>1</sup>, Kenji Fukuzawa<sup>1</sup>, Shintaro Itoh<sup>1</sup>, Hedong Zhang<sup>1</sup>, Naoki Azuma<sup>1</sup>; <sup>1</sup>Nagoya University**SESSION T04-S10**

16:40 – 17:40 • OCEANIA VII

**Session Chair(s):** Pierluigi Bilotto**16:40 - T04-S10.1**

ID: 4EPF

Oral presentation

**Modelling Hair Friction in the Presence of Additives**Pietra Martina Cerqueira Diaz<sup>1</sup>, Erik Weiland<sup>1</sup>, James P. Ewen<sup>2,1</sup>, Stefano Angioletti-Uberti<sup>1</sup>, Yuri Roiter<sup>3</sup>, Jessa Meyers<sup>3</sup>, Dariush Hosseinpour<sup>3</sup>, Francisco Rodriguez-Ropero<sup>3</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Bath, <sup>3</sup>The Procter and Gamble Company**17:00 - T04-S10.2**

ID: 4ERQ

Oral presentation

**Compatibility of 2D MoSe<sub>2</sub> and WSe<sub>2</sub> Nanoparticles with Oil Compositions: Impact on Wear Reduction**Kostyantyn Grinkevych<sup>1</sup>, Natalia Konih-Ettel<sup>1</sup>, Ostap Zgalat-Lozynskyi<sup>1</sup>, Roman Nevshupa<sup>2</sup>; <sup>1</sup>I.M. Frantsevich Institute for Problems of Materials Science, <sup>2</sup>CSIC**17:20 - T04-S10.3**

ID: 4ETM

Oral presentation

**Adhesive contact mechanics via a self-consistent body-force formulation**Musuvathi Santhaparipoornam Bobji<sup>1</sup>, Uzair Iqbal<sup>1</sup>; <sup>1</sup>Indian Institute of Science, Bengaluru**Thursday, September 24****SESSION T04-S11**

09:30 – 10:50 • OCEANIA VII

**Session Chair(s):** Seong H. Kim**09:45 - T04-S11.1**

ID: 4DNQ

Invited Speaker

**Controlling Friction Properties of 2D Materials through Substrate/Surface Modification**Philip Egberts<sup>1</sup>; <sup>1</sup>University of Calgary

**10:10 - T04-S11.2**

ID: 4EVY

Oral presentation

**Enhancement of DLC Tribology Using Graphene and Nanodiamond under Solid and Water-Lubricated Conditions**Yuki Hirata<sup>1</sup>, Taiki Okita<sup>1</sup>, Ruixi Zhang<sup>1</sup>; <sup>1</sup>Institute of Science Tokyo**10:30 - T04-S11.3**

ID: 4EYQ

Oral presentation

**Novel Materials for Solid Lubrication Based on High Entropy Alloy Disulfides**Tomas Polcar<sup>1,2</sup>, Yue Wang<sup>1</sup>, Martin Cada<sup>3</sup>, Zdenek Hubicka<sup>3</sup>, Shubham Agarwal<sup>1</sup>, Antonio Cammarata<sup>1</sup>; <sup>1</sup>Czech Technical University, <sup>2</sup>University of Southampton, <sup>3</sup>Czech Academy of Sciences**SESSION T04-S12**

11:30 – 12:30 • OCEANIA VII

**Session Chair(s):** Fabrice Dassenoy**11:30 - T04-S12.1**

ID: 4F2Y

Oral presentation

**Intermolecular forces of single MXene flakes prepared by interfacial deposition**Pierluigi Bilotto<sup>1</sup>, Marko Piljević<sup>2</sup>, Sabine Schwarz<sup>3</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>3</sup>University Service Centre for Transmission Electron Microscopy**11:50 - T04-S12.2**

ID: 4F4F

Oral presentation

**Influence and Regulation of Surface Forces and Lubrication by Nanoscale Surface Roughness**Bo Feng<sup>1</sup>, Tianyi Han<sup>1</sup>, Chenhui Zhang<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University**12:10 - T04-S12.3**

ID: 4F6K

Oral presentation

**Fluid film effect on the motion of an externally excited loosely supported tubular structure**Matteo Delli Colli<sup>1</sup>, Benyebka BOU-SAÏD<sup>2</sup>, Descartes<sup>2</sup>, Francesco Massi<sup>3</sup>, Carole Falcand<sup>1</sup>, Nabil Marouf<sup>1</sup>; <sup>1</sup>Framatome, <sup>2</sup>Institut national des Science Appliquées de Lyon, <sup>3</sup>Università degli Studi di Roma La Sapienza**POSTER PRESENTATIONS****Tuesday, September 22****SESSION Poster 02**

16:00 – 16:40 • America

**02.1**

ID: 4EZK

**- Deep learning and reactive force fields in the context of molecular dynamics simulations of doublewall carbon nanotube-based nanobearings friction performance**Cristiano Simões de Abreu<sup>1</sup>, José Manuel Ramos Gomes<sup>2</sup>; <sup>1</sup>Instituto Superior de Engenharia do Porto, <sup>2</sup>Universidade do Minho**02.2**

ID: 4E6V

**- Grease Film Thickness and Availability in Thermoplastic Rolling-Sliding Contacts**Ferdinand Schmid<sup>1</sup>, Stefan Hofmann<sup>1</sup>, Thomas Lohner<sup>1</sup>, Karsten Stahl<sup>1</sup>; <sup>1</sup>Technical University of Munich, Gear Research Center



**02.3 ID: 4DTT - Composite Nanolubricants for Wear Reduction in Mechanical Interfaces: Leveraging Diffusion and Atomic Disorder**

Hua Jiang<sup>1,2</sup>, Xianjun Hou<sup>1,2</sup>, Chen Chu<sup>1,2</sup>, Weiwei Guan<sup>1,3</sup>, Bo Yi<sup>4</sup>, Mohamed Kamal Ahmed Ali<sup>5</sup>; <sup>1</sup>Wuhan University of Technology, <sup>2</sup>Hubei Longzhong Laboratory, <sup>3</sup>Nanyang Technological University, <sup>4</sup>South China University of Technology, <sup>5</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**02.4 ID: 4EKG - Multiscale Screening of Self-Lubricating Graphene-Reinforced Epoxy and IPN Nanocomposites under Dry Sliding**

Matheus Mendes de Oliveira<sup>1</sup>, MARCIA MARIE MARU<sup>2</sup>, Eduardo Tomanik<sup>1</sup>; <sup>1</sup>Universidade Federal do ABC, <sup>2</sup>National Institute of Metrology, Quality and Technology

**02.5 ID: 4EBA - Geometrical properties of asperities on real contact area**

Mark Kuzman<sup>1</sup>, Mitjan Kalin<sup>2</sup>; <sup>1</sup>Univerza v Ljubljani, <sup>2</sup>University of Ljubljana

**02.6 ID: 4EVH - Asperity sliding contact in the presence of adhesion**

Uzair Iqbal<sup>1</sup>, Musuvathi Santhapariipoornam Bobji<sup>1</sup>; <sup>1</sup>Indian Institute of Science, Bengaluru

**02.7 ID: 4DWA - Effect of Silver Addition on the Tribological Properties of High Entropy Alloys**

Wojciech Łoński<sup>1</sup>, Maciej Łuszcz<sup>1</sup>, Rafał Babilas<sup>2</sup>, Katarzyna Młynarek Żak<sup>2</sup>; <sup>1</sup>Łukasiewicz Research Network - Institute for Sustainable Technologies, <sup>2</sup>Silesian University of Technology in Gliwice

**02.8 ID: 4ECY - Real-Time Digital Image Correlation for In-Situ Analysis of Frictional Slip and Fracture in Tribological Contacts**

Yang, Yinlong<sup>1</sup>, Zhuoyi Yin<sup>1</sup>, Giuseppe Carbone<sup>1</sup>; <sup>1</sup>Nanjing University of Science & Technology

**02.9 ID: 4E6X - Superlubrication and Energy Consumption of Two-Dimensional Materials**

Yuhong Liu<sup>1</sup>; <sup>1</sup>Tsinghua University

**02.10 ID: 4DVG - Influence of electrical current on the tribological performance of functionalized nanoparticles anti-wear additives abstract for a poster**

Zhengyuan PENG<sup>1</sup>, Frédéric GEORGI<sup>1</sup>, Pierre MONTMITONNET<sup>1</sup>, Imène Lahouij<sup>1</sup>; <sup>1</sup>Centre de Mise En Forme de Matériaux

## TRACK 05

### Advances in Tribochemistry and Lubrication Mechanisms: Emerging Insights into Lubricants and Additives.

## ORAL PRESENTATIONS

## Monday, September 21

## SESSION P02

11:30 – 12:30 • EUROPA III-IV

Session Chair(s): Fernando Lázaro Freire Junior

## 11:30 - P02.1

ID: 4FCG

Plenary Speaker

## Advances of Solid-Liquid Combined Superlubricity (SLCS)

Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University

## SESSION T05-S01

14:40 – 16:00 • OCEANIA IX

Session Chair(s): Maria Isabel De Barros Bouchet

## 14:50 - T05-S01.1

ID: 4FDC

Keynote Speaker

## Keynote talk - prof. Seong H. Kim

Seong H. Kim<sup>1</sup>; <sup>1</sup>Pennsylvania State University

## 15:20 - T05-S01.2

ID: 4DPS

Oral presentation

Effect of PIB Succinimide Dispersant on the Stability and Tribological Performance of MoS<sub>2</sub> Nanoparticle Dispersions in PAOFabrice Dassenoy<sup>1</sup>; <sup>1</sup>École Centrale de Lyon

## 15:40 - T05-S01.3

ID: 4DWX

Oral presentation

## Film Formation Behavior of Nanoparticles under Rolling Contact Lubrication

Yoji Sunagawa<sup>1</sup>; <sup>1</sup>Idemitsu Kosan Co.,LTd.

## SESSION T05-S02

16:40 – 18:00 • OCEANIA IX

Session Chair(s): Andreas Rosenkranz

## 16:40 - T05-S02.1

ID: 4DRD

Oral presentation

## Evolution of the tribofilm and wear state transition mechanism of cylinder liner and piston ring

Chang Ge<sup>1</sup>, Hang Li<sup>1</sup>, Xing Xu<sup>1</sup>, Yufan Zhu<sup>1</sup>, Xuan Ma<sup>1</sup>, Xiqun Lu<sup>1</sup>, Zhigang Liu<sup>1</sup>; <sup>1</sup>Harbin Engineering University

## 17:00 - T05-S02.2

ID: 4DS2

Oral presentation

## Mechanochemistry of Ashless Antiwear Additive

Chung Yan Leung<sup>1</sup>, Jie Zhang<sup>1</sup>, Hugh A. Spikes<sup>2</sup>, Janet S. S. Wong<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College

## 17:20 - T05-S02.3

ID: 4DSP

Oral presentation

## Tribological response of ceramic-graphene composites under ASTM G133: role of counterface, carbon content and environment

Céline TREVISIOL<sup>1</sup>, Yan-Ming CHEN<sup>1</sup>, Adam BERRAIS<sup>2</sup>, Hussein ABOELEINEIN<sup>3</sup>, Bruno BERTHEL<sup>3</sup>, Lucile JOLY-POTTUZ<sup>4</sup>, MASENELLI-VARLOT<sup>4</sup>, Alicia WEIBEL<sup>2</sup>, Christiphe LAURENT<sup>2</sup>, Viviane TURQ<sup>2</sup>, Maria Isabel De Barros Bouchet<sup>3</sup>; <sup>1</sup>Centre Technique des Industries Mécaniques, <sup>2</sup>Université de Toulouse, <sup>3</sup>Centrale Lyon, <sup>4</sup>Institut national des Science Appliquées de Lyon

**17:40 - T05-S02.4**

ID: 4EYY

Oral presentation

**Elastohydrodynamic Film Thickness and Traction at High Speeds**

Nubtong Vanisri<sup>1</sup>, Amir Kadiric<sup>2,1</sup>, Guillermo E. Morales-Espejel<sup>3</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College, <sup>3</sup>SKF Research and Technology Development

**Tuesday, September 22****SESSION T05-S03**

09:30 – 10:50 • OCEANIA IX

**Session Chair(s):** Benyebka BOU-SAÏD**09:45 - T05-S03.1**

ID: 4FDF

Invited Speaker

**From EV Shaft Currents to Electrically Stimulated Lubricants: A New Paradigm for Friction and Wear Control**

Leonardo Israel Farfan Cabrera<sup>1</sup>; <sup>1</sup>Tecnológico de Monterrey

**10:10 - T05-S03.2**

ID: 4DQS

Oral presentation

**Tribocatalytic Carbon Tribofilm for Ultra-Low Wear of PEEK Composites under Fuel Lubrication**

Chao Wang<sup>1</sup>, Qingduo Meng<sup>2</sup>, Fuzhi Song<sup>1</sup>, Tingmei Wang<sup>1</sup>, Qihua Wang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, <sup>2</sup>Qingdao University

**10:30 - T05-S03.3**

ID: 4DW2

Oral presentation

**Tribo-chemical analysis of a next-generation, fire-resistant, hybrid silicone-based oil**

Thomas LUBRECHT<sup>1,2</sup>, Elio PIRAS<sup>2</sup>, Christophe CORBUN<sup>2</sup>, Vincent FRIDRICI<sup>1</sup>, Fabrice Dassenoy<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>NYCO Research Laboratory

**SESSION T05-S04**

11:30 – 12:30 • OCEANIA IX

**Session Chair(s):** Clotilde MINFRAY**11:30 - T05-S04.1**

ID: 4DWD

Oral presentation

**Interpreting oscillatory-shear measurements of viscosity in unbounded flows to understand shear-thinning behavior of lubricants in lubricated contacts**

Christian A. Utreras-Silva<sup>1</sup>, Shreyas V. Jalikop<sup>1</sup>, Bernhard Scheichl<sup>2</sup>, András Vernes<sup>3,1</sup>, Michal Kráčalik<sup>1</sup>, Hendrik J Ehrich<sup>3,1</sup>, Lucia Pisarova<sup>1</sup>; <sup>1</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>2</sup>TU Wien, <sup>3</sup>Technische Universität Wien

**11:50 - T05-S04.2**

ID: 4DTM

Oral presentation

**Molecular Origins of Fluid Viscosity: From Shear-Thinning to Glass Formation**

Rosa M Espinosa-Marzal<sup>1</sup>, Francois Sidoroff<sup>2</sup>, Wilfred T Tysoe<sup>3</sup>; <sup>1</sup>University of Illinois Urbana Champaign, <sup>2</sup>École Centrale de Lyon, <sup>3</sup>University of Wisconsin-Milwaukee

**12:10 - T05-S04.3**

ID: 4DXQ

Oral presentation

**Deteriorative Effect of Water on the Boundary Lubrication Performance of Engine Oils**

Weimin Li<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**SESSION T05-S05**

14:40 – 16:00 • OCEANIA IX

**Session Chair(s):** Wilfred T Tysoe**14:40 - T05-S05.1**

ID: 4E2Z

Oral presentation

**Size-driven tribo-chemical activity: Near-atomic-scale phosphorus-based particles enable self-adaptive high-stress macro-superlubricity via refactoring the carbon-based film from lubricating oil**Peili Gao<sup>1</sup>; <sup>1</sup>Tsinghua University**15:00 - T05-S05.2**

ID: 4E4P

Oral presentation

**Self-Lubricating PEEK Composite Based on Mechanically Responsive Hydrogel Microcapsules**Wanxing Xu<sup>1</sup>, Tianyi Han<sup>2</sup>, Chenhui Zhang<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Tsinghua University China**15:20 - T05-S05.3**

ID: 4E4R

Oral presentation

**Neutron reflection Characterisation of Lipid Analogues Adsorption at Steel/water Interface for Water-based Lubrication**Xuzhi Hu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences**15:40 - T05-S05.4**

ID: 4E66

Oral presentation

**Tribochemistry of iron oxide and DBP interactions in electrified environments.**Lucio Roberto Menezes<sup>1</sup>, Matheus Ruviero Laroza<sup>1</sup>, Rômulo Porto Ferreira<sup>1</sup>, Gáveni Barbosa Valério<sup>1</sup>, Marcelo Braga dos Santos<sup>1</sup>, José Daniel Biasoli Mello<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia**SESSION T05-S06**

16:40 – 18:00 • OCEANIA IX

**Session Chair(s):** Leonardo Israel Farfan Cabrera**16:40 - T05-S06.1**

ID: 4EAK

Oral presentation

**Lubrication at the Electrified Surfaces: Atomistic Insights**Zhaoran Zhu<sup>1</sup>, Yun Zhao<sup>1</sup>, Janet S. S. Wong<sup>1</sup>, Eliane Gendreau<sup>2</sup>, James P. Ewen<sup>3,1</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Shell Research Limited, UK, <sup>3</sup>University of Bath**17:00 - T05-S06.2**

ID: 4EAM

Oral presentation

**Lubricant behaviours in electrified tribology**Yun Zhao<sup>1</sup>, Jie Zhang<sup>1</sup>, Hugh A. Spikes<sup>2,1</sup>, Janet S.S. Wong<sup>2</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College**17:20 - T05-S06.3**

ID: 4ECA

Oral presentation

**Co-optimizing friction and conductivity of carbon tribofilms on Pt-Au alloys**Frank W. DelRio<sup>1</sup>, Tomas F. Babuska<sup>1</sup>, Kyle R. Dorman<sup>1</sup>, David P. Adams<sup>1</sup>, Alexandra Vaughn<sup>2</sup>, Filippo Mangolini<sup>2</sup>, John F. Curry<sup>1</sup>; <sup>1</sup>Sandia National Laboratories, <sup>2</sup>University of Texas Austin**17:40 - T05-S06.4**

ID: 4F4A

Oral presentation

**Tunable tribology properties of shape memory polymer**Zenghui Yang<sup>1</sup>, Hui Liu<sup>2</sup>, Qihua Wang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, <sup>2</sup>Lanzhou Institute of Chemical Physics

## Wednesday, September 23

### SESSION T05-S07

09:30 – 10:50 • OCEANIA IX

**Session Chair(s):** Maria Clelia Righi

#### 09:40 - T05-S07.1

ID: 4FDD

Keynote Speaker

#### Keynote talk - Koshi Adachi

Koshi Adachi<sup>1</sup>; <sup>1</sup>Tohoku University

#### 10:10 - T05-S07.2

ID: 4EET

Oral presentation

#### Effect of simultaneous use of corrosion inhibitor and anti wear additive on the resulting wear and corrosion protection

Merle Reimers<sup>1</sup>, Georg Jacobs<sup>1</sup>, Marius Bürger<sup>1</sup>; <sup>1</sup>MSE - RWTH Aachen University

#### 10:30 - T05-S07.3

ID: 4EFP

Oral presentation

#### Micro-particles: toward a revolution in tribology

Paul-marie Zubieta-Laborde<sup>1</sup>, Graham L.W. Cross<sup>2</sup>, Georg S. Duesberg<sup>3</sup>, Frédéric Dubreuil<sup>1</sup>, Maria Isabel De Barros Bouchet<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>Trinity College University of Dublin, <sup>3</sup>Universität der Bundeswehr

### SESSION T05-S08

11:30 – 12:30 • OCEANIA IX

**Session Chair(s):** Mitjan Kalin

#### 11:30 - T05-S08.1

ID: 4EGA

Oral presentation

#### Mo(VI) dithiocarbamate friction behavior in steel-steel contact under boundary lubrication

Clotilde MINFRAY<sup>1</sup>, Mathilde VERDUNO<sup>1</sup>, Zakaria QORAICHE<sup>2</sup>, Pavel AFANASIEV<sup>2</sup>, Alessandra QUADRELLI<sup>2</sup>, Audrey MOLZA<sup>1</sup>, Olivier HEINTZ<sup>1</sup>, Julien FONTAINE<sup>1</sup>; <sup>1</sup>LTDS CNRS Ecole centrale de Lyon, <sup>2</sup>Ircelyon

#### 11:50 - T05-S08.2

ID: 4EGT

Oral presentation

#### Effects of Methanol as an Alternative Fuel on Lubricated Interfaces in Maritime Transport

Xinhe Xiong<sup>1</sup>, Cayetano Espejo<sup>1</sup>, Eliette Pinel<sup>2</sup>, Anna-Luiza Mendes-Siqueira<sup>2</sup>, Gregory Descroix<sup>2</sup>, Ardian Morina<sup>1</sup>; <sup>1</sup>University of Leeds, <sup>2</sup>TotalEnergies One Tech

#### 12:10 - T05-S08.3

ID: 4EGV

Oral presentation

#### Stress-Dependent Tribofilm Formation of ZDP under Full-Film EHD Conditions: Comparison with ZDDP

Chuan Chieh Wang<sup>1</sup>, Janet S. S. Wong<sup>1</sup>, Hugh A. Spikes<sup>2,1</sup>, Jie Zhang<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College

**SESSION T05-S09**

14:40 – 16:00 • OCEANIA IX

**Session Chair(s):** Maria Clelia Righi**14:40 - T05-S09.1**

ID: 4EGZ

Oral presentation

**Optical Observation of Boundary-Activated MoS<sub>2</sub> Tribofilm for the Sustainability of Liquid Superlubricity of PEG**

Lukáš Daněk<sup>1</sup>, Petr Šperka<sup>1</sup>, Tomáš Poláček<sup>1</sup>, David Pavliňák<sup>2</sup>, Ivan Saldan<sup>2</sup>, Jan M. Macak<sup>2</sup>, Ivan Křupka<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>Central European Institute of Technology

**15:00 - T05-S09.2**

ID: 4E4V

Oral presentation

**Macro-Superlubricity on Steel under High Sliding and Contact Pressure**

Hanglin Li<sup>1</sup>, Xudong Sui<sup>2</sup>, Carsten Gachot<sup>2</sup>, Jiusheng Li<sup>1</sup>; <sup>1</sup>Shanghai Advanced Research Institute, Chinese Academy of Sciences, <sup>2</sup>Technische Universität Wien

**15:20 - T05-S09.3**

ID: 4EJC

Oral presentation

**Effect of Graphene Reinforcement on the Tribological Behavior and Mechanical Properties of Si<sub>3</sub>N<sub>4</sub> Nanocomposites**

Hussein ABOELEINEIN<sup>1</sup>, Adam Berrais<sup>2</sup>, Alicia Weibel<sup>2</sup>, Christiphe LAURENT<sup>3,2</sup>, Viviane TURQ<sup>3</sup>, MASENELLI-VARLOT<sup>4</sup>, Lucile JOLY-POTTUZ<sup>4</sup>, Annie Malchere<sup>4</sup>, Yan-Ming CHEN<sup>5</sup>, Céline TREVISIOL<sup>5</sup>, Bruno BERTHEL<sup>6</sup>, Maria Isabel De Barros Bouchet<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>University Toulouse - CIRIMAT, <sup>3</sup>Université de Toulouse, <sup>4</sup>Institut national des Science Appliquées de Lyon, <sup>5</sup>Centre Technique des Industries Mécaniques, <sup>6</sup>École Centrale de Lyon

**15:40 - T05-S09.4**

ID: 4EJS

Oral presentation

**Experimental strategy to study the effect of environment on MoDTC friction reduction capabilities**

Clotilde MINFRAY<sup>1</sup>, Mathilde VERDUNO<sup>1</sup>, Zakaria QORAICHE<sup>2</sup>, Pavel AFANASIEV<sup>2</sup>, Jules GALIPAUD<sup>1</sup>, Alessandra QUADRELLI<sup>2</sup>, Audrey MOLZA<sup>1</sup>, Olivier HEINTZ<sup>1</sup>, Julien FONTAINE<sup>1</sup>; <sup>1</sup>LTDS CNRS Ecole centrale de Lyon, <sup>2</sup>Ircelyon

**SESSION T05-S10**

16:40 – 18:00 • OCEANIA IX

**Session Chair(s):** Fabrice Dassenoy**16:40 - T05-S10.1**

ID: 4EJV

Oral presentation

**Molecular Simulations to Screen Additives for Future Fuels and Lubricants**

Jeevan S. Purewal<sup>1</sup>, Carlos Corral-Casas<sup>1</sup>, James P. Ewen<sup>2,1</sup>, Mark Brewer<sup>3</sup>, Alastair Smith<sup>4</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Bath, <sup>3</sup>Shell Global Solutions (Deutschland) GmbH, <sup>4</sup>Shell Research Limited, UK

**17:00 - T05-S10.2**

ID: 4EJX

Oral presentation

**The Stick-Slip to Superlubricity Transition: Atomic-Scale Evidence of Graphene Oxide Tribofilm on Nitride Ceramics**

Huajie Tang<sup>1,2</sup>, Xinchun Chen<sup>2</sup>, Jianlin Sun<sup>1</sup>, Jianbin Luo<sup>2</sup>; <sup>1</sup>University of Science & Technology Beijing, <sup>2</sup>Tsinghua University

**17:20 - T05-S10.3**

ID: 4EKM

Oral presentation

**Bubble Mechanisms in Antifoam Containing Oils**

Thomas Reddyhoff<sup>1</sup>, Paul-Anaël Pogu<sup>1</sup>, Li Shen<sup>1</sup>, Eliane Gendreau<sup>2</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Shell Research Limited, UK

**Thursday, September 24****SESSION T05-S11**

09:30 – 10:50 • OCEANIA IX

**Session Chair(s):** Maria Isabel De Barros Bouchet**09:45 - T05-S11.1**

ID: 4FDE

Invited Speaker

**Advancing Lubricant Design with Machine-Learning-Informed Molecular Dynamics**

Maria Clelia Righi<sup>1</sup>; <sup>1</sup>Università di Bologna

**10:10 - T05-S11.2**

ID: 4EP6

Oral presentation

**Neutron Imaging of Oil-Impregnated Sintered Gears for Self-Lubrication**

Thomas Lohner<sup>1</sup>, Simon Sebold<sup>2</sup>, Nicolai Sprogies<sup>1</sup>, Karsten Stahl<sup>3,1</sup>; <sup>1</sup>Technical University of Munich, Gear Research Center, <sup>2</sup>Heinz Maier-Leibnitz Zentrum, Technical University of Munich, <sup>3</sup>Technical University of Munich, Gear Research Centre

**10:30 - T05-S11.3**

ID: 4EPH

Oral presentation

**Nanostructured Tribolayers Enabling Heavy-Load Adaptive Superlubricity in Carbon-Based Solid Films**

Xinchun Chen<sup>1</sup>, Wenli Deng<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University

**SESSION T05-S12**

11:30 – 12:30 • OCEANIA IX

**Session Chair(s):** Andreas Rosenkranz**11:30 - T05-S12.1**

ID: 4EPX

Oral presentation

**Effect of carbon nanomaterials on the structure and chemistry of ZDDP tribofilms**

Juan Pablo Abdelnabe<sup>1,2</sup>, Barbara Šetina Batič<sup>3</sup>, Germán Prieto<sup>1,4,2</sup>, Walter Roberto Tuckart<sup>1,4,2</sup>, Eduardo Tomanik<sup>5</sup>, Bojan Podgornik<sup>3</sup>; <sup>1</sup>Universidad Nacional del Sur, <sup>2</sup>Consejo Nacional de Investigaciones Científicas y Técnicas, <sup>3</sup>Institute of Metals and Technology, <sup>4</sup>Instituto de Física del Sur, <sup>5</sup>Universidade Federal do ABC

**11:50 - T05-S12.2**

ID: 4EDN

Oral presentation

**Influence of the environment on the tribological properties of a solid lubricant transfer film containing MoS<sub>2</sub>**

Thomas Rey<sup>1,2</sup>, Eric Papin<sup>1</sup>, Vincent FRIDRICI<sup>3</sup>, Fabrice Dassenoy<sup>4</sup>; <sup>1</sup>Dipostel, <sup>2</sup>Laboratoire de Tribologie et Dynamique des Systèmes, <sup>3</sup>Centrale Lyon, <sup>4</sup>École Centrale de Lyon

**12:10 - T05-S12.3**

ID: 4EQR

Oral presentation

**Rolling–Sliding Friction Behavior of a combination of Copper Oleate and EP Additives in a Low-Viscosity Lubricant Compared with Commercial Oils**

Borja Armendariz-Molinero<sup>1</sup>, Francesco Pagano<sup>1</sup>, José Tomás San José-Lombera<sup>2</sup>, Ichiro Minami<sup>3</sup>; <sup>1</sup>Fundación Tekniker, <sup>2</sup>Universidad del País Vasco, <sup>3</sup>Lulea University of Technology / Luleå tekniska universitet

**SESSION T05-S13**

14:40 – 16:00 • OCEANIA IX

**Session Chair(s):** Thomas Reddyhoff**14:40 - T05-S13.1**

ID: 4ERM

Oral presentation

**Mechanism of Sulfur-Based Tribofilm Formation and Frictional Properties under Controlled Atmospheres**SUN LIN<sup>1</sup>; <sup>1</sup>Kyoto University**15:00 - T05-S13.2**

ID: 4ERR

Oral presentation

**Toward High Performance Greases by Incorporating Tribofilm-Forming Zirconia Nanocrystals**Mateus da Silva Cardoso<sup>1</sup>, Cinta Lorenzo-Martin<sup>2</sup>, Nicholas G. Demas<sup>2</sup>, Aaron C. Greco<sup>2</sup>, Robert J. Wiacek<sup>3</sup>, Michael Blumenfeld<sup>4</sup>, Robert W. Carpick<sup>1</sup>; <sup>1</sup>University of Pennsylvania, <sup>2</sup>Argonne National Laboratory, <sup>3</sup>Pixelligent Technologies LLC, <sup>4</sup>ExxonMobil Technology & Engineering Company**15:20 - T05-S13.3**

ID: 4EMV

Oral presentation

**Tribological Performance of MWCNT Nanolubricants for Electric Vehicle Transmissions**Lucas Costa de Araújo<sup>1</sup>, DERYKY FLAVIO FERNANDES DA SILVA<sup>1</sup>, Salete Martins Alves<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte**15:40 - T05-S13.4**

ID: 4EWW

Oral presentation

**Mitigation of Electrochemical Wear in Steel Contacts Lubricated under Electric Current by Ionic Liquid additive**Ronaldo Rodrigues Ramos da Silva<sup>1</sup>, Salete Martins Alves<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte**SESSION T05-S14**

16:40 – 17:40 • OCEANIA IX

**Session Chair(s):** Thomas Lohner**16:40 - T05-S14.1**

ID: 4EXW

Oral presentation

**High-speed thermoelastohydrodynamic friction with entrained air**Alexander MacLaren<sup>1</sup>, Thomas Welham<sup>1</sup>, Matt Smeeth<sup>1</sup>; <sup>1</sup>PCS Instruments Ltd**17:00 - T05-S14.2**

ID: 4EXZ

Oral presentation

**Role of hBN nanoparticles in PEG on boundary friction and lubrication in non-conformal contacts**Petr Šperka<sup>1</sup>, Lukáš Daněk<sup>1</sup>, David Pavlíňák<sup>1</sup>, Tomáš Poláček<sup>1</sup>, Ivan Saldan<sup>1</sup>, Ivan Křupka<sup>1</sup>, Jan M. Macak<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology**17:20 - T05-S14.3**

ID: 4EY4

Oral presentation

**Friction Performance of Bio-Oils Obtained by Different Cell Disruption Methods**Lucia Vieira<sup>1,2</sup>, Thainá Barbosa de Lima Cordeiro<sup>2</sup>, Ana Barbara Goulart<sup>2</sup>, Virginia Klausner de Oliveira<sup>2</sup>, Jose Geraldo da Cruz Pradella<sup>2</sup>, Polyana Alves Radi<sup>3</sup>, Adélio Manuel Sousa Cavadas<sup>4</sup>; <sup>1</sup>Instituto Tecnológico de Aeronáutica, <sup>2</sup>Universidade do Vale do Paraíba, <sup>3</sup>Universidade Federal de São Paulo, <sup>4</sup>Instituto Politécnico de Viana do Castelo**Friday, September 25**



**SESSION T05-S15**

09:30 – 10:50 • OCEANIA IX

**Session Chair(s):** Koshi Adachi**09:40 - T05-S15.1**

ID: 4EBT

Keynote Speaker

**Tribochemistry in superlubricity of water-based lubricants**Mitjan Kalin<sup>1</sup>; <sup>1</sup>University of Ljubljana**10:10 - T05-S15.2**

ID: 4ENG

Oral presentation

**Tribological Performance of Water-Based Lubricants at High Speeds**WengHong Fong<sup>1</sup>, Amir Kadirci<sup>2</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Imperial College**10:30 - T05-S15.3**

ID: 4EYW

Oral presentation

**A Multi-Technique Experimental Framework for Assessing Lubricant-Driven White Etching Crack Formation in Rolling Bearing**Hakim El Bahi<sup>1</sup>, Christelle Vacher<sup>2</sup>, Benjamin Lehmann<sup>3</sup>, Peter Roessler<sup>4</sup>, Quentin ARNOUX<sup>1</sup>, Goulven Bouvier<sup>1</sup>, Sophie Loehlé<sup>1</sup>, Driss Ben Mouhamed<sup>1</sup>; <sup>1</sup>TotalEnergies, <sup>2</sup>NTN Europe, <sup>3</sup>RWTH Aachen University, <sup>4</sup>MSE - RWTH Aachen University**POSTER PRESENTATIONS****Tuesday, September 22****SESSION Poster 02**

16:00 – 16:40 • America

**02.11 ID: 4ENA - Self-lubricating High-Entropy Alloy & Transition Metal Dichalcogenide Composites: Tribological Performance and Mechanisms**Dogyun Byeon<sup>1</sup>, Sungmin Yoon<sup>1</sup>; <sup>1</sup>Changwon National University**02.12 ID: 4F6J - Effects of friction modifier on stick-slip properties of wet clutch transmission fluid for AWD differentials**Elena Torskaya<sup>1</sup>, Alexei Morozov<sup>1</sup>, Denis V. Mironenko<sup>1</sup>, Yaroslav V. Yarmovich<sup>1</sup>, Vasilina Lapitskaya<sup>2</sup>; <sup>1</sup>Ishlinsky Institute for Problems in Mechanics RAS, <sup>2</sup>A.V. Luikov Institute of Heat and Mass Transfer of the National Academy of Sciences**02.13 ID: 4EV4 - Evaluation of the Tribological Behavior of Greases: An Approach Based on Infrared Spectroscopy (FTIR) and Mini-Traction Machine Measurements**Larissa Solano de Almeida<sup>1</sup>, João Carlos Fernandes de Queiróz<sup>1</sup>, Newton Kiyoshi Fukumasu<sup>1</sup>, Francisco José Profíto<sup>1</sup>, Roberto Martins de Souza<sup>1</sup>, Alvaro Canto Michelotti<sup>2</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Centro Universitário de Brusque**02.14 ID: 4DP6 - Protic Oil-soluble Ionic Liquids: The Structure Design and Lubrication Mechanism Study**Litian Hu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**02.15 ID: 4EYP - Effect of Graphene Additives on Inconel 625 Processed by Spark Plasma Sintering**

Nicole Machia Silva<sup>1</sup>, Juliane Ribeiro da Cruz<sup>2</sup>, João Felipe Sippel<sup>3</sup>, Ana Sofia Clímaco Monteiro D'Oliveira<sup>3</sup>; <sup>1</sup>Escola Politécnica de Universidade de São Paulo, <sup>2</sup>Universidade de São Paulo, <sup>3</sup>Universidade Federal do Paraná

**02.16 ID: 4DYY - Wear resistance of cermet titanium-based materials with hBN addition**

Maciej Łuszcz<sup>1</sup>, Remigiusz Michalczewski<sup>1</sup>, Javier A. Ortega<sup>2</sup>; <sup>1</sup>Łukasiewicz Research Network - Institute for Sustainable Technologies, <sup>2</sup>University of Texas Rio Grande Valley

**02.17 ID: 4FAF - MoS<sub>2</sub> Shell Microcapsules Assembled from Nanoflower Structures: A Stimuli-Responsive, High-Efficiency Lubricant**

Tingmei Wang<sup>1</sup>, Liang Bao<sup>1</sup>, Qihua Wang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

## TRACK 06

### Tribology in Manufacturing, Mining, Transport Systems and Integrated Circuits

## ORAL PRESENTATIONS

### Monday, September 21

#### SESSION T06-S01

14:40 – 16:00 • EUROPA III-IV

**Session Chair(s):** Giovanni Straffellini

**14:50 - T06-S01.1**

ID: 4FDG

Keynote Speaker

**Tribo-surface and volume properties of laser powder bed fused (LPBF) H13 tool steel in hot die-casting applications**

Mohamed EL MANSORI<sup>1</sup>; <sup>1</sup>École Nationale Supérieure des Arts et Métiers

**15:20 - T06-S01.2**

ID: 4DMG

Oral presentation

**How to understand the influence of ammonia on piston ring-liner tribology system?**

Xuan Ma<sup>1</sup>, Xing Xu<sup>1</sup>, Chang Ge<sup>1</sup>, Xiqun Lu<sup>1</sup>; <sup>1</sup>Harbin Engineering University

**15:40 - T06-S01.3**

ID: 4DV4

Oral presentation

**Influence of steel cleanliness on the sliding wear resistance of railway wheels**

João Vitor Raimundo Silva e Silva<sup>1</sup>, Daniela Nunes Oliveira<sup>1</sup>, Carlos Alberto Rosa Neto<sup>1</sup>, Mário José Bueno de Souza Freitas<sup>2</sup>, Paulo Roberto Mei<sup>2</sup>, Cherlio Scandian<sup>1</sup>, Nathan Fantecelle Strey<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>Universidade Estadual de Campinas

**SESSION T06-S02**

16:40 – 17:40 • EUROPA III-IV

**Session Chair(s):** Adilson Rodrigues da Costa**16:40 - T06-S02.1**

ID: 4DN2

Oral presentation

**Integration of Electric Arc Furnace (EAF) Steel Slag into Friction Materials: Tribological Properties, Wear, and Emissions**Giovanni Straffellini<sup>1</sup>, Ana Paula Gomes Nogueira<sup>2</sup>, Stefano Candeo<sup>1</sup>, Cosmo di Cecca<sup>3</sup>, Lorenzo Angelini<sup>3</sup>;<sup>1</sup>University of Trento, <sup>2</sup>Brembo NV, <sup>3</sup>Feralpi Group**17:00 - T06-S02.2**

ID: 4DPD

Oral presentation

**Surface analysis deployment for automotive brake system assessment**Ana Paula Gomes Nogueira<sup>1</sup>, Pietro Tonolini<sup>1</sup>, Giovanni Straffellini<sup>2</sup>; <sup>1</sup>Brembo NV, <sup>2</sup>University of Trento**17:20 - T06-S02.3**

ID: 4DV2

Oral presentation

**Atomic Level Material Removal Mechanism of Chip Surface**Linmao Qian<sup>1</sup>, Liang Jiang<sup>1</sup>, Yuan Wu<sup>1</sup>, Yushan Chen<sup>1</sup>, Yongshun Zhang<sup>1</sup>, Jiaxin Zheng<sup>1</sup>; <sup>1</sup>Southwest Jiaotong University**Tuesday, September 22****SESSION T06-S03**

09:30 – 10:50 • EUROPA III-IV

**Session Chair(s):** Carsten Gachot**09:30 - T06-S03.1**

ID: 4DPN

Oral presentation

**Heat-Treatment Effects on Microstructure and Wear of L-PBF 316L Stainless Steel**German Omar Barrionuevo<sup>1</sup>, Magdalena Walczak<sup>2</sup>, Jorge Ramos Grez<sup>2</sup>; <sup>1</sup>Universidad San Francisco de Quito,<sup>2</sup>Pontificia Universidad Católica de Chile**09:50 - T06-S03.2**

ID: 4DXT

Oral presentation

**Hydrogen-Related Alterations in Aluminum Alloy Piston Materials for Hydrogen Combustion Engines Following Deuterium Irradiation**Yoshiki Matsumoto<sup>1</sup>, Kenji Matsumoto<sup>2</sup>, Yuji Mihara<sup>1</sup>; <sup>1</sup>Tokyo City University, <sup>2</sup>Tokyo Denki University**10:10 - T06-S03.3**

ID: 4EXQ

Oral presentation

**Tribochemical Processing of Carbonates: Advancing Low Carbon and Sustainable Industrial Technologies**Roman Nevshupa<sup>1</sup>, ESMERALDA MUÑOZ CORTES<sup>1</sup>, Marta Castellote<sup>1</sup>, RIDWAN OLAMIDE AGBAOYE<sup>1</sup>, José Ramón Ares<sup>2</sup>; <sup>1</sup>CSIC, <sup>2</sup>Universidad Autónoma de Madrid**10:30 - T06-S03.4**

ID: 4EDX

Oral presentation

**Flexible, transparent and conductive silver line electrodes fabricated using surface energy-directed assembly process on polyethylene naphthalate substrates**Yihuan Wang<sup>1</sup>, Zhimin Chai<sup>1</sup>; <sup>1</sup>Tsinghua University**SESSION T06-S04**

11:30 – 12:30 • EUROPA III-IV

**Session Chair(s):** Bart Raeymaekers

**11:30 - T06-S04.1**

ID: 4DRR

Oral presentation

**AISI 420S Stainless Steel Additively Manufactured by L-DED in the As-Built and Heat-Treated States: Characterization and Tribological Performance**

Jean Honorato Ramos<sup>1</sup>, Gustavo Henrique Zoschke<sup>1</sup>, Naiah Domingues Ferracioli<sup>1</sup>, Marcelo Taveira Veiga<sup>1</sup>, Moises Felipe Teixeira<sup>1</sup>, Jurandir Marcos Sá de Sousa<sup>1</sup>; <sup>1</sup>Senai Innovation Institute for Manufacturing System and Laser Processing

**11:50 - T06-S04.2**

ID: 4DSA

Oral presentation

**Experimental investigation of tire-wear particle sizes**

Alexander Schmiedhofer<sup>1</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien

**12:10 - T06-S04.3**

ID: 4ETE

Oral presentation

**Green Stainless Steels as Wear Resistant Materials for Erosion-Corrosion Applications in the Agribusiness Sector**

Vitor Pagani de Souza<sup>1,2</sup>, Arthur Santana de Mendonça<sup>3</sup>, Vanessa de Freitas Cunha Lins<sup>1</sup>, Wilian da Silva Labiapari<sup>2</sup>, Henara Lillian Costa<sup>4</sup>, José Daniel Biasoli Mello<sup>3,5</sup>; <sup>1</sup>Universidade Federal de Minas Gerais, <sup>2</sup>Aperam South America, <sup>3</sup>Universidade Federal de Santa Catarina, <sup>4</sup>Universidade Federal do Rio Grande, <sup>5</sup>Universidade Federal de Uberlândia

**SESSION T06-S05**

14:40 – 16:00 • EUROPA III-IV

**Session Chair(s):** Ana Paula Gomes Nogueira

**14:40 - T06-S05.1**

ID: 4DQZ

Oral presentation

**Development of a Wear Test Method for Emulsion Performance Evaluation**

Lais M. Lopes<sup>1</sup>; <sup>1</sup>Falex Tribology

**15:00 - T06-S05.2**

ID: 4DVV

Oral presentation

**Comparison of severe and mild wear test conditions for assessing low-stress sliding mild abrasive wear of commercial transfer chute lining materials**

Luis Alfredo Acevedo Suarez<sup>1</sup>, Renato Chaves Pereira da Silva<sup>1</sup>, Vinícius Carvalho Teles<sup>2</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>, Jose Jimmy Penagos<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale, <sup>2</sup>Universidade Federal de Goiás

**15:20 - T06-S05.3**

ID: 4DWF

Oral presentation

**Influence of counterpart and oil formulation on wear of DLC-coated differential shafts for electric vehicles**

Pauline Faura<sup>1</sup>, Johnny Dufils<sup>1</sup>, Jérémy Gassmann<sup>1</sup>, Etienne Macron<sup>1</sup>; <sup>1</sup>IREIS - HEF Group

**15:40 - T06-S05.4**

ID: 4DWP

Oral presentation

**Tribological Comparison of Pantograph Contact Materials for Railway Sliding Electrical Interfaces**

Oreen Oumer<sup>1</sup>, Eric Gavignet<sup>1</sup>, Didier CHAMAGNE<sup>1</sup>, Pierre-Henri Cornuault<sup>1</sup>, Philippe Baucour<sup>1</sup>; <sup>1</sup>Université Marie-et-Louis-Pasteur

**SESSION T06-S06**

16:40 – 17:40 • EUROPA III-IV

**Session Chair(s):** Lais M. Lopes**16:40 - T06-S06.1**

ID: 4DWR

Oral presentation

**Atomistic study of material removal behavior during ultrasonic vibration assisted nanoscratching of single-crystal AlN**Chen Xiao<sup>1</sup>, Linmao Qian<sup>1</sup>; <sup>1</sup>Southwest Jiaotong University**17:00 - T06-S06.2**

ID: 4DWZ

Oral presentation

**Mechanistic analysis and data-driven prediction of churning losses in multi-shaft transmission systems**Wenjing Zhang<sup>1</sup>, Dan Guo<sup>1</sup>, Koucheng Zuo<sup>1</sup>; <sup>1</sup>Tsinghua University**17:20 - T06-S06.3**

ID: 4DXM

Oral presentation

**Predicting the Evolution of Fretting Wear in Spline Couplings Under Representative Conditions**Allan Gichuki<sup>1</sup>; <sup>1</sup>University of Nottingham**Wednesday, September 23****SESSION T06-S07**

09:30 – 10:50 • EUROPA III-IV

**Session Chair(s):** Liang Jiang**09:30 - T06-S07.1**

ID: 4DZT

Oral presentation

**Airborne wear particle emissions from a light aircraft brake**Yurii Tsybrii<sup>1</sup>, Oleksii Nosko<sup>1</sup>, Zbigniew Skorupka<sup>2</sup>, Magdalena Lepicka<sup>3</sup>; <sup>1</sup>Gdansk University of Technology / Politechnika Gdanska, <sup>2</sup>Łukasiewicz Research Network – Institute of Aviation, <sup>3</sup>Bialystok University of Technology**09:50 - T06-S07.2**

ID: 4E2V

Oral presentation

**Manufacturing of hybrid bearing washers using a novel carbide containing alloy**Yusuf Faqiri<sup>1</sup>, Thomas Hassel<sup>2</sup>; <sup>1</sup>Universität Hannover, <sup>2</sup>Leibniz University Hannover**10:10 - T06-S07.3**

ID: 4E42

Oral presentation

**Performance Evaluation of transfer learning for surface damage identification in tribological systems**Sina Akhbari<sup>1</sup>, Mahdi Mohammad-Pour<sup>1</sup>, Sara Sharifzadeh<sup>2</sup>, Mahdi Mohammadpour<sup>3</sup>; <sup>1</sup>TriboDENS Ltd, <sup>2</sup>Swansea University, <sup>3</sup>Loughborough University**10:30 - T06-S07.4**

ID: 4E4B

Oral presentation

**Experimental and Numerical Investigation of Biodegradable Hydraulic Lubricant Performance in Axial Piston Pumps**Pedro Martins Ferreira<sup>1</sup>, Jinhwan Lee<sup>2</sup>, Fan Zhang<sup>1</sup>, Lizhi Shang<sup>2</sup>; <sup>1</sup>TotalEnergies, <sup>2</sup>Purdue University

**SESSION T06-S08**

11:30 – 12:30 • EUROPA III-IV

**Session Chair(s):** Yuri Tsybrii**11:30 - T06-S08.1**

ID: 4E4G

Oral presentation

**Tribo-rheological and thermal characterization of vegetable oil in water microemulsions as a potential water-based fluid for metalworking applications**JAVIER A. FRIAS-FLORES<sup>1</sup>, ESTEBAN F. MEDINA-BAÑUELOS<sup>1</sup>, Ezequiel A. Gallardo-Hernández<sup>2</sup>, Benjamín M. Marín-Santibañez<sup>1</sup>; <sup>1</sup>Instituto Politécnico Nacional, <sup>2</sup>Instituto Politecnico Nacional**11:50 - T06-S08.2**

ID: 4E4J

Oral presentation

**Tribomechanical Evaluation of FeCrNiMo Alloy Reinforced with WC Deposited by L-DED**Flavio Ghedin Neto<sup>1</sup>, Richard de Medeiros Castro<sup>1</sup>, Renato Camponogara Panziera<sup>2</sup>, Milton Pereira<sup>2</sup>, Clauber Roberto Melo Marques<sup>1</sup>, Israel da Silva Miranda<sup>1</sup>, Jurandir Marcos Sá de Sousa<sup>3</sup>; <sup>1</sup>Centro Universitário Satc, <sup>2</sup>Universidade Federal de Santa Catarina, <sup>3</sup>Senai Innovation Institute for Manufacturing System and Laser Processing**12:10 - T06-S08.3**

ID: 4E4Q

Oral presentation

**Atomic material removal mechanism in ultra-precision chemical mechanical polishing of bearings and gears**Liang Jiang<sup>1,2</sup>, Rongpei Wang<sup>1</sup>, Wumao Peng<sup>1</sup>, Linmao Qian<sup>1</sup>; <sup>1</sup>Southwest Jiaotong University, <sup>2</sup>Yanghua Zhizao (Sichuan) Innovation Technologies Co., Ltd.**SESSION T06-S09**

14:40 – 16:00 • EUROPA III-IV

**Session Chair(s):** Andys Hernandez Peña**14:40 - T06-S09.1**

ID: 4E62

Oral presentation

**Effect of heat treatment on the tribocorrosion behavior of 20Cr13 martensitic stainless steel**Shengli Jiang<sup>1</sup>, Yining Zhou<sup>1</sup>, Deli Duan<sup>2</sup>; <sup>1</sup>Institute of Metal Research, Chinese Academy of Sciences, <sup>2</sup>Institute of Metal Research, Chinese Academy of Sciences**15:00 - T06-S09.2**

ID: 4E64

Oral presentation

**Tribocorrosive wear behavior of grinding media in Miller Test**Mariana Luíza Souza da Silva Guimarães<sup>1</sup>, Anna Carolina Augusto Gomes<sup>1</sup>, Larah Helen Costa<sup>1</sup>, Bruna Eduarda Ribeiro<sup>1</sup>, Maria Aparecida Pinto<sup>1</sup>; <sup>1</sup>Universidade Federal de Ouro Preto**15:20 - T06-S09.3**

ID: 4E6G

Oral presentation

**Analyses of the coupling between thermomechanical and tribological processes during a railway braking test**Sylvain Delattre<sup>1</sup>, Philippe Dufrénoy<sup>2</sup>, Yannick Desplanques<sup>1</sup>, Anne-lise Cristol<sup>1</sup>, Michèle Henrion<sup>3</sup>, François Guillard<sup>3</sup>; <sup>1</sup>Centrale Lille, <sup>2</sup>Université de Lille, <sup>3</sup>ALSTOM**15:40 - T06-S09.4**

ID: 4E6N

Oral presentation

**Investigation of the Influence of Stress Relaxation Behavior on Radial Stress in Nonwoven Fabric Winding Processes.**Shuya Nishioka<sup>1</sup>, Yuki Hatanaka<sup>1</sup>, Satoru Iwamori<sup>1</sup>; <sup>1</sup>Tokai University

**SESSION T06-S10**

16:40 – 18:00 • EUROPA III-IV

**Session Chair(s):** Jose Jimmy Penagos**16:40 - T06-S10.1**

ID: 4EAZ

Oral presentation

**Atomic-scale Tribochemical Differences During Chemical Mechanical Polishing of Copper and Silicon in the Integrated Circuits Manufacturing**Lifei Zhang<sup>1</sup>, Xinchun Lu<sup>1</sup>; <sup>1</sup>Tsinghua University**17:00 - T06-S10.2**

ID: 4EBX

Oral presentation

**Tribological Behavior and Iron Ore Flow on UHMWPE Materials for Truck Body Liners**Kamila de Fatima Costa da Silva<sup>1</sup>, Thalia Gomes dos Santos<sup>1</sup>, Reynner Lucas Tobias<sup>1</sup>, Eleir Mundim Bortoleto<sup>1</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>, Gustavo Tressia<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale**17:20 - T06-S10.3**

ID: 4EC2

Oral presentation

**Improved high-temperature solid particle erosion resistance of Hadfield steel by boriding**Andys Hernandez Peña<sup>1</sup>, César David Reséndiz Calderón<sup>1</sup>, Gabriel Caballero Bustamante<sup>1</sup>, Leonardo Israel Farfan Cabrera<sup>1</sup>; <sup>1</sup>Tecnológico de Monterrey**17:40 - T06-S10.4**

ID: 4ECX

Oral presentation

**The impact of spin on elastohydrodynamic contacts for traction: A Theoretical and Experimental Investigation of Ball-Disc Contact**Chiara Cupertino<sup>1</sup>, Francesco Bottiglione<sup>1</sup>, Giuseppe Carbone<sup>2</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Nanjing University of Science & Technology**Thursday, September 24****SESSION T06-S11**

09:30 – 10:50 • EUROPA III-IV

**Session Chair(s):** Mohamed EL MANSORI**09:30 - T06-S11.1**

ID: 4EEJ

Oral presentation

**Elastohydrodynamic lubrication friction dependence on energy density and build orientation for SLM printed AISi10Mg and 18Ni300**Urban Klanjscek<sup>1</sup>, Mitjan Kalin<sup>1</sup>; <sup>1</sup>University of Ljubljana**09:50 - T06-S11.2**

ID: 4EEX

Oral presentation

**Application of Sliding Abrasion Tumbler Test in the evaluation of abrasive wear resistance of commercial ceramic materials used in transfer chute linings.**Letícia Dias Batista<sup>1,2</sup>, Jose Jimmy Penagos<sup>2</sup>, Cristian Camilo Viáfara Arango<sup>2</sup>; <sup>1</sup>Universidade Federal de Ouro Preto, <sup>2</sup>Instituto Tecnológico Vale**10:10 - T06-S11.3**

ID: 4EEY

Oral presentation

**Insights on the wear behavior of rolling element bearings containing mixed-material contact interfaces**Ryan D. Evans<sup>1</sup>; <sup>1</sup>The Timken Company

**10:30 - T06-S11.4**

ID: 4EFX

Oral presentation

**In-situ NbC-reinforced self-lubricating iron matrix composites via vacuum impregnation**

Isadora Schramm Deschamps<sup>1</sup>, Fernando Yoshiaki Miyata<sup>1</sup>, Enzo Vanzuita Piazero<sup>1</sup>, Daniel dos Santos Avila<sup>2</sup>,  
Javiera Contreras<sup>3</sup>, Nicolás Ignacio Araya Rivera<sup>3</sup>, Aloisio Nelmo Klein<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina,  
<sup>2</sup>Delft University of Technology TU Delft, <sup>3</sup>Universidad de Concepción

**SESSION T06-S12**

11:30 – 12:30 • EUROPA III-IV

**Session Chair(s):** Ryan D. Evans**11:30 - T06-S12.1**

ID: 4EG2

Oral presentation

**Microstructural and tribological investigation of niobium carbide-reinforced copper-free brake friction material produced by powder metallurgy**

Augusto Adami Vidal<sup>1</sup>, Maurício Vitor Kozerski Giaretton<sup>1</sup>, Arthur Garcia Lima da Cruz<sup>1</sup>, André de Oliveira Françoze<sup>1</sup>,  
Isadora Schramm Deschamps<sup>1</sup>, Tatiana Bendo<sup>1</sup>, Aloisio Nelmo Klein<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**11:50 - T06-S12.2**

ID: 4EGJ

Oral presentation

**Practical Experiences with the Service Life of Greases at High Temperatures**

Jiri Valdauf<sup>1</sup>, Ing. Martin Legner<sup>1</sup>, Ing. Jozef Siska<sup>1</sup>; <sup>1</sup>LUBRICANT s.r.o.

**12:10 - T06-S12.3**

ID: 4EGR

Oral presentation

**Putting boundary friction effects into cold strip rolling mixed lubrication models**

Pierre MONTMITONNET<sup>1</sup>, Imène Lahouij<sup>1</sup>, ELHAJJ Cynthia<sup>1</sup>, LUONG Linh Phuong<sup>2</sup>, MITHIEUX Jean-Denis<sup>2</sup>;  
<sup>1</sup>MINES Paris, PSL University, Centre for material forming (CEMEF), <sup>2</sup>Aperam

**SESSION T06-S13**

14:40 – 16:00 • EUROPA III-IV

**Session Chair(s):** Radovan Galas**14:40 - T06-S13.1**

ID: 4EHC

Oral presentation

**Abrasive wear of Fe–SiC cermets processed by hot pressing and spark plasma sintering**

Yovany Oropesa Márquez<sup>1</sup>, Sergio Saucedo Martínez<sup>2</sup>, Javiera Belén Contreras Cerón<sup>1</sup>, Izabel Fernanda Machado<sup>3</sup>,  
Sheila Lascano Farak<sup>4</sup>, Nicolás Ignacio Araya Rivera<sup>1</sup>; <sup>1</sup>Universidad de Concepción, <sup>2</sup>Pontificia Universidad Católica  
de Valparaíso, <sup>3</sup>Universidade de São Paulo, <sup>4</sup>Universidad Técnica Federico Santa María

**15:00 - T06-S13.2**

ID: 4EHP

Oral presentation

**A Universal Strategy for Uniform Patterning of Diverse Functional Materials via Controlled Marangoni Flow**

Guangji Wang<sup>1</sup>, Zhimin Chai<sup>1</sup>, Yihuan Wang<sup>1</sup>, Guojia Yu<sup>1</sup>, Siqing Yuan<sup>1</sup>, Jingwei Zhang<sup>1</sup>, Xinchun Lu<sup>1</sup>; <sup>1</sup>Tsinghua  
University

**15:20 - T06-S13.3**

ID: 4EK6

Oral presentation

**How Hybrid scCO<sub>2</sub>-MQL Lubrication Controls Tribology and Surface Integrity in Ti-6Al-4V Machining**

Nan Xu<sup>1</sup>, Muhammad Raihan<sup>1</sup>, Harvey Thompson<sup>1</sup>, Nikil Kapur<sup>1</sup>, Chris Martin Taylor<sup>1</sup>, Ardian Morina<sup>1</sup>; <sup>1</sup>University of  
Leeds



**15:40 - T06-S13.4**

ID: 4EKD

Oral presentation

**Experimental investigation of a hydrodynamic journal bearing operating under server conditions**Lucas RAVAUD<sup>1</sup>, Jean BOUYER<sup>1</sup>, Pascal Jolly<sup>2</sup>; <sup>1</sup>Institut Pprime, <sup>2</sup>Université de Poitiers**SESSION T06-S18**

16:40 – 17:40 • OCEANIA IV

**Session Chair(s):** Anne-lise Cristol**16:40 - T06-S18.1**

ID: 4EVK

Oral presentation

**The impact of water and hydraulic oil contamination in cold rolling oil on the surface quality of stainless steels.**Géssica Seara Faria<sup>1</sup>, Lucio Roberto Menezes<sup>2</sup>, Wilian da Silva Labiapari<sup>1</sup>, Luiz Paulo Mendonca Brandão<sup>3</sup>, José Daniel Biasoli Mello<sup>2</sup>; <sup>1</sup>Aperam South America, <sup>2</sup>Universidade Federal de Uberlândia, <sup>3</sup>Instituto Militar de Engenharia**17:00 - T06-S18.2**

ID: 4EWW

Oral presentation

**Beyond the Friction Coefficient: Creep Curves for Wheel–Rail Friction Assessment**Radovan Galas<sup>1</sup>, Martin Valena<sup>1</sup>, Tomas Jordan<sup>1</sup>, Daniel Kvarda<sup>1</sup>, Simon Skurka<sup>1</sup>, Milan Omasta<sup>1</sup>, Ivan Krupka<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology**17:20 - T06-S18.3**

ID: 4EXM

Oral presentation

**The dominant role of carbide network architecture over chromium content in the scratch response of high-chromium cast irons grinding media**Eleir Mundim Bortoleto<sup>1</sup>, Victor Cardoso Campideli<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale**SESSION T06-S14**

16:40 – 17:40 • EUROPA III-IV

**Session Chair(s):** Nan Xu**16:40 - T06-S14.1**

ID: 4EKS

Oral presentation

**Effect of Tempering Treatment on Microstructure and Mechanical Properties of D2 Tool Steel for Wear-Intensive Applications**Venu Yarasu<sup>1</sup>, Bojan Podgornik<sup>1</sup>, Barbara Šetina Batič<sup>1</sup>, Marko Sedlaček<sup>1</sup>, Peter Jurci<sup>2</sup>; <sup>1</sup>Institute of Metals and Technology, <sup>2</sup>Slovak University of Technology**17:00 - T06-S14.2**

ID: 4ENQ

Oral presentation

**Friction Modification on Wet Rails: Adhesion, Wear and RCF**Simon Skurka<sup>1</sup>, Radovan Galas<sup>1</sup>, Jiaxin Li<sup>2</sup>, Honghao Wang<sup>2</sup>, Milan Omasta<sup>1</sup>, Haohao Ding<sup>2</sup>, Wenjian Wang<sup>2</sup>, Ivan Krupka<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>Southwest Jiaotong University**17:20 - T06-S14.3**

ID: 4ENM

Oral presentation

**Dry-Sliding Wear Resistance of AISI 410L Martensitic Stainless Steel Additively Manufactured by L-DED in the As-Built and Heat-Treated Conditions**Jurandir Marcos Sá de Sousa<sup>1</sup>, Milton Pereira<sup>2</sup>, Paulo Cordeiro Machado<sup>3</sup>, Richard de Medeiros Castro<sup>4</sup>; <sup>1</sup>Senai Innovation Institute for Manufacturing System and Laser Processing, <sup>2</sup>Universidade Federal de Santa Catarina, <sup>3</sup>Universidade Federal do Pará, <sup>4</sup>Centro Universitário Satc

## Friday, September 25

**SESSION T06-S19**

09:30 – 10:50 • OCEANIA IV

**Session Chair(s):** Rachid Msaoubi**09:30 - T06-S19.1**

ID: 4EYC

Oral presentation

**Comparison of the Abrasion Resistance of High-Performance Steels Using Ball Cratering Micro-Abrasion**LUCAS SOUZA EUZEBIO<sup>1</sup>, Ney Francisco Ferreira<sup>1</sup>, Patric Daniel Neis<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Sul**09:50 - T06-S19.2**

ID: 4EYN

Oral presentation

**Erosive Wear of Wire-Based Additively Manufactured 316L Stainless Steel**Bruno Corveto Bragança<sup>1</sup>, Julia Mazzoni Moura<sup>2</sup>, Maksym Ziberov<sup>3</sup>, Déborah de Oliveira<sup>3</sup>, Cherlio Scandian<sup>2</sup>, Nathan Fantecelle Strey<sup>2</sup>; <sup>1</sup>UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO, <sup>2</sup>Universidade Federal do Espírito Santo, <sup>3</sup>Universidade de Brasília**10:10 - T06-S19.3**

ID: 4F4K

Oral presentation

**Simulation and Experimental Study on Copper fluid Jet Polishing**Dan Guo<sup>1</sup>, Wenjing Zhang<sup>1</sup>, Xin Zhang<sup>2</sup>, Tiancheng Ai<sup>1</sup>, Guoshun Pan<sup>1</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Tsinghua University China**SESSION T06-S15**

09:30 – 10:50 • EUROPA III-IV

**Session Chair(s):** Roman Nevshupa**09:30 - T06-S15.1**

ID: 4EPQ

Oral presentation

**Quantification of Zn adhesion on cast iron for stamping tools**Derek Manoel Luup Carvalho<sup>1</sup>, Pedro Paulo Búrigo Bastos<sup>1</sup>, Francisco Cavilha Neto<sup>1</sup>, João Pedro Vaz Silveira<sup>1</sup>, Diego Berti Salvaro<sup>1</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina**09:50 - T06-S15.2**

ID: 4EQ2

Oral presentation

**Effect of Multiple Metallic Powder Reuse Cycles on the Tribological Performance of Additively Manufactured 316L Stainless Steel by L-DED**Jhonattan Gutjahr<sup>1</sup>, Milton Pereira<sup>2</sup>, Henrique Santos Ferreira<sup>1</sup>, Anselmo Thiesen Junior<sup>1</sup>, Jurandir Marcos Sá de Sousa<sup>1</sup>; <sup>1</sup>Senai Innovation Institute for Manufacturing System and Laser Processing, <sup>2</sup>Universidade Federal de Santa Catarina**10:10 - T06-S15.3**

ID: 4EQB

Oral presentation

**From Tribology to Manufacturing: Tribochemistry-Enabled Fabrication of Functional Thin Films**yuyang.yuan<sup>1</sup>, Chun Wang<sup>1</sup>, Seunghwan Lee<sup>1</sup>, Abdel Dorgham<sup>1</sup>, Tarun Kakkar<sup>1</sup>, Gin Jose<sup>1</sup>, Ardian Morina<sup>1</sup>; <sup>1</sup>University of Leeds

**10:30 - T06-S15.4**

ID: 4EQZ

Oral presentation

**EFFECT OF WELD DEFECTS IN RAILS ON WEAR NUMBER TGAMMA USING DYNAMIC MULTIBODY MODELING**

Pablo Restrepo Barrientos<sup>1,2</sup>, Juan Esteban Lopez Londoño<sup>2</sup>, Juan Felipe Santa Marín<sup>2</sup>; <sup>1</sup>Instituto Tecnológico Metropolitano, <sup>2</sup>Universidad Nacional de Colombia

**SESSION T06-S16**

11:30 – 12:30 • EUROPA III-IV

**Session Chair(s):** Hélio Goldenstein**11:30 - T06-S16.1**

ID: 4ER4

Oral presentation

**Synergistic wear mechanisms in grinding media: how does the wear of grinding balls occur?**

Victor Cardoso Campideli<sup>1</sup>, Eleir Mundim Bortoleto<sup>1</sup>, Jose Jimmy Penagos<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale

**11:50 - T06-S16.2**

ID: 4ES2

Oral presentation

**Optimisation of EV drivetrain fluids using a system-level efficiency model**

Joseph Shore<sup>1</sup>, Amir Kadiric<sup>1</sup>; <sup>1</sup>Imperial College

**12:10 - T06-S16.3**

ID: 4ES4

Oral presentation

**Study on the Tribological Properties of TiC-316L Composites Prepared by MEAM**

Shujun Zhou<sup>1</sup>, Shikang Huang<sup>1</sup>, Yilun Yang<sup>1</sup>, Zeyu Wan<sup>1</sup>; <sup>1</sup>China University of Mining & Technology Beijing

**SESSION T06-S20**

11:30 – 12:30 • OCEANIA IV

**Session Chair(s):** Zhimin Chai**11:30 - T06-S20.1**

ID: 4F4W

Oral presentation

**Comparative evaluation of the abrasive wear response on brake pads of SUV and pickup trucks using a modified ASTM G65 method**

German Omar Barrionuevo<sup>1</sup>, Lorena Bejarano<sup>1</sup>, Alfredo Valarezo<sup>1</sup>, Daniel Salvador Cajo Baez<sup>1</sup>, Angie Torres<sup>1</sup>, Erika Cueva<sup>1</sup>; <sup>1</sup>Universidad San Francisco de Quito

**11:50 - T06-S20.2**

ID: 4F6G

Oral presentation

**Niobium carbide as allrounder for machining and wear protection**

Mathias woydt<sup>1</sup>, Eduardo Cannizza<sup>2</sup>, Rodney Genga<sup>3</sup>; <sup>1</sup>MATRILUB, <sup>2</sup>EHT Consultoria em Engenharia Ltda, <sup>3</sup>University of the Witwatersrand

**12:10 - T06-S20.3**

ID: 4FDP

Oral presentation

**Wear analysis of the friction stir welding (FSW) tool for the AA6063 aluminum welding process**

Isnardo González Jaimes<sup>1</sup>, Kevin Buriticá<sup>1</sup>, Robin Cristancho<sup>1</sup>; <sup>1</sup>Universidad Industrial de Santander

**SESSION T06-S17**

14:00 – 16:00 • EUROPA III-IV

**Session Chair(s):** Isnardo González Jaimes**14:00 - T06-S17.1**

ID: 4ETD

Oral presentation

**Numerical analysis of thermal fatigue behavior of AISI H13 tool steel produced by Power Bed Laser Fusion (PBF-LB/M)**Vinicius Alves de Lima<sup>1</sup>, Roberto Martins de Souza<sup>1</sup>; <sup>1</sup>Universidade de São Paulo**14:20 - T06-S17.2**

ID: 4ETF

Oral presentation

**Fabrication of Electronics and Sensors using a Surface Energy-Directed Assembly Process**Zhimin Chai<sup>1</sup>; <sup>1</sup>Tsinghua University**14:40 - T06-S17.3**

ID: 4ETP

Oral presentation

**Stretchable Serpentine Electrodes with High Fidelity Fabricated Using Orientation-Controlled Surface Energy-Directed Assembly**Siqing Yuan<sup>1</sup>, Zhimin Chai<sup>1</sup>; <sup>1</sup>Tsinghua University**15:00 - T06-S17.4**

ID: 4ETQ

Oral presentation

**Evolution of Corrosion-Induced Friction and Wear Mechanisms in Cylinder Liner Material under Methanol Engine Conditions**Hang Li<sup>1</sup>, Chang Ge<sup>1</sup>, Xing Xu<sup>1</sup>, Xuan Ma<sup>1</sup>, Xiqun Lu<sup>1</sup>; <sup>1</sup>Harbin Engineering University**15:20 - T06-S17.5**

ID: 4ETS

Oral presentation

**Effect of Additive Manufacturing Process (SLM vs. LMD) on Cavitation Erosion Resistance of SS316L**Anderson Geraldo Marenda Pukaszewicz<sup>1</sup>, Hipolito Carvajal Fals<sup>1</sup>, Jeferson Trevisan Pacheco<sup>2</sup>, Marcio Ferreira Hupalo<sup>3</sup>, José Henrique Teixeira<sup>3</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Senai Innovation Institute for Manufacturing System and Laser Processing, <sup>3</sup>Universidade Estadual de Ponta Grossa**15:40 - T06-S17.6**

ID: 4EPB

Oral presentation

**Evaluation of Zinc Adhesion on Cast Iron Tool Materials**Pedro Paulo Búrigo Bastos<sup>1</sup>, Francisco Cavilha Neto<sup>1</sup>, Derek Manoel Luup Carvalho<sup>1</sup>, João Pedro Vaz Silveira<sup>1</sup>, Alicia Correa Lucena<sup>1</sup>, Diego Berti Salvaro<sup>1</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina**SESSION T06-S21**

14:00 – 16:00 • OCEANIA IV

**Session Chair(s):** Joseph Shore**14:00 - T06-S21.1**

ID: 4F6S

Oral presentation

**A COMPARATIVE STUDY OF ROLLING-CONTACT FATIGUE-INDUCED WEAR IN TEMPERED LOWER BAINITE, UPPER BAINITE, AND PEARLITE**Samuel da Silva de Souza<sup>1</sup>, Kazim Yildirimli<sup>2</sup>, Kate Tomlinson<sup>3</sup>, Roberto Martins de Souza<sup>1</sup>, Roger Lewis<sup>3</sup>, Hélio Goldenstein<sup>1</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Cumhuriyet University, <sup>3</sup>University of Sheffield

**14:20 - T06-S21.2**

ID: 4FA6

Oral presentation

**Mechanisms of material removal in Nd-Fe-B permanent magnet**

Erick Cardoso Costa<sup>1</sup>, Ygor Gabriel da Silveira Romeiro<sup>1</sup>, Leonardo Silva Duarte<sup>1</sup>, Roberto Martins de Souza<sup>2</sup>, Paulo Antônio Pereira Wendhausen<sup>1</sup>, Fabio Antonio Xavier<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina, <sup>2</sup>Universidade de São Paulo

**14:40 - T06-S21.3**

ID: 4FAY

Oral presentation

**In-situ High Resolution Digital Image Correlation (HRDIC) Analysis of Strain Distribution Around Artificially Generated WEL in Advanced Rail Steels**

Lucas Biazon Cavalcanti<sup>1</sup>, Jack Donoughue<sup>2</sup>, Sefer Can Erman<sup>1</sup>, Kamran Mumtaz<sup>1</sup>, David Fletcher<sup>1</sup>, Roger Lewis<sup>1</sup>, Kate Tomlinson<sup>1</sup>; <sup>1</sup>University of Sheffield, <sup>2</sup>University of Manchester

**15:00 - T06-S21.4**

ID: 4FBK

Oral presentation

**Bringing the Dead Zone to Life: In-Situ Visualization of Interfacial Stagnation in Metal Cutting**

Rachid Msaoubi<sup>1</sup>; <sup>1</sup>Lund University

## POSTER PRESENTATIONS

Wednesday, September 23

**SESSION Poster 03**

10:50 – 11:30 • America

**03.24 ID: 4EGX - Innovative Green Ingredients for Sustainable Automotive Brake Friction Materials**

Ana Paula Gomes Nogueira<sup>1</sup>, Pietro Tonolini<sup>1</sup>, Giovanni Straffellini<sup>2</sup>, Davide Carlevaris<sup>2</sup>, Gustavo Gehlen<sup>2</sup>; <sup>1</sup>Brembo NV, <sup>2</sup>University of Trento

**03.25 ID: 4Ezt - Experimental and Numerical Analysis of the Influence of Surface Morphology on the Tribological Behavior and Contact Mechanics of Polyurethane Rail Pads**

Angélica de Fátima Nogueira Vicente<sup>1</sup>, Iara Melo da Silva<sup>2</sup>, Luciano de Oliveira<sup>2</sup>, Eleir Mundim Bortoleto<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale, <sup>2</sup>Vale S/A

**03.26 ID: 4DYB - Laser Cladding Effects on Abrasive Wear Resistance of Hardox 400 Steel**

Dawid Romek<sup>1,2</sup>, Dariusz Ulbrich<sup>1</sup>, Jarosław Selech<sup>1</sup>, Piotr Banaś<sup>1</sup>; <sup>1</sup>Poznan University of Technology, <sup>2</sup>Łukasiewicz Research Network – ITECH Institute of Innovation and Technology

**03.27 ID: 4EN2 - Grinding Performance of a Structured Wheel with Internal Cooling Channels**

Sharlane Maria Costa<sup>1,2,3</sup>, Paulina Capela<sup>1,4</sup>, João Eduardo Ribeiro<sup>3</sup>, Mário Antônio Caixeiro Castro Pereira<sup>5</sup>, Delfim Fernandes Soares<sup>1,2</sup>; <sup>1</sup>Center for MicroElectromechanical Systems, <sup>2</sup>Associate Laboratory, <sup>3</sup>Mountain Research Center, <sup>4</sup>Mechanical Engineering and Resource Sustainability Center, <sup>5</sup>Centro de Física das Universidades do Minho e do Porto

**03.28 ID: 4EBP - Assessment of abrasive wear resistance of RAVUR250HR, SAE1045, and HSLA501 steels**

Fábio Dian Murari<sup>1</sup>, Herbert Christian Borges<sup>1</sup>, Edwaldo Ferreira Brandao<sup>1</sup>; <sup>1</sup>USIMINAS

**03.29 ID: 4FAV - Influence of Surface Pre-Treatment on Wear Resistance of Patinas Formed on Weathering Steel under Atmospheric Exposure**

Hadille Emanuele Gonçalves Mendes<sup>1</sup>, Felipe Kevin Correia Luz<sup>1</sup>, Márcio L. A. Cunha<sup>2</sup>, Marlise Moreira<sup>1</sup>, José Henrique Alano<sup>1</sup>, Henara Lillian Costa<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande, <sup>2</sup>Arcelor Mittal Brasil

**03.30 ID: 4EMK - Tribological Interaction in W–Cu Sintered Composites: Role of Cu Nanoflakes in W Particle Adhesion and Resistance to Particle Detachment**

Sergio Saucedo Martínez<sup>1</sup>, Francisco Briones<sup>1</sup>, Nicolás Ignacio Araya Rivera<sup>2</sup>, Sheila Lascano Farak<sup>3</sup>, Yovany Oropesa Márquez<sup>2</sup>, Cristina Arévalo Mora<sup>4</sup>; <sup>1</sup>Pontificia Universidad Católica de Valparaíso, <sup>2</sup>Universidad de Concepción, <sup>3</sup>Universidad Técnica Federico Santa María, <sup>4</sup>Universidad de Sevilla

**03.31 ID: 4EDF - Effect of Printing Direction of 3D-Printed Nylon Under Abrasive Wear Conditions**

Francisco Briones<sup>1</sup>, BARBARA VALVERDE<sup>1</sup>, RICARDO DONAIRE<sup>1</sup>, Álvaro González<sup>1</sup>, Federico Antico<sup>2</sup>, Carola Martínez Ugalde<sup>3</sup>; <sup>1</sup>Pontificia Universidad Católica de Valparaíso, <sup>2</sup>Universidad Adolfo Ibáñez, <sup>3</sup>Universidad de la Frontera

**03.32 ID: 4EEC - Effect of Deformation-Induced Changes in Elasto-Plastic Properties on Galling Resistance of AISI 304 Stainless Steel**

Andres Esteban Romero<sup>1,2</sup>, Gaston Romero Pietrafesa<sup>1,3</sup>, Fernando Buezas<sup>1,3</sup>, Walter Roberto Tuckart<sup>1,3</sup>, Germán Prieto<sup>1,3</sup>; <sup>1</sup>Universidad Nacional del Sur, <sup>2</sup>Universidad Tecnológica Nacional, <sup>3</sup>Instituto de Física del Sur

**03.33 ID: 4ESQ - Investigating Bearing Surface Damage via Coupled Electro-Thermal Analysis**

Hamed Eshraghi<sup>1,2</sup>, Peyman Havaej<sup>1,2</sup>, Dieter Fauconnier<sup>1,2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Flanders Make

**03.34 ID: 4EVP - Blickensderfer's methodology in a field wear test to evaluate wear-resistant materials for transfer chute linings**

Jose Jimmy Penagos<sup>1</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>, Renato Chaves Pereira da Silva<sup>2,1</sup>, Luis Alfredo Acevedo Suarez<sup>1</sup>, Christian Mariani Lucas dos Santos<sup>3</sup>, Wilson Ribeiro Machado<sup>4</sup>, Marcel Roberto Castanheira<sup>4</sup>, Felipe Ribeiro da Fonseca<sup>4</sup>; <sup>1</sup>Instituto Tecnológico Vale, <sup>2</sup>Universidade Federal de Ouro Preto, <sup>3</sup>Instituto Federal de Educação, Ciência e Tecnologia do Espírito Santo, <sup>4</sup>Vale S/A

**03.35 ID: 4E6R - Surface Integrity in Micromilling of NiTiNol for Medical Applications**

JOSENILTON DOS SANTOS LOPES<sup>1</sup>, Thaise Alonso<sup>1</sup>, Marcus Vinícius de Oliveira<sup>1</sup>, Milla Caroline Gomes<sup>2</sup>, Rahul Davis<sup>3</sup>, Carlos José de Araújo<sup>4</sup>, Márcio Bacci da Silva<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia, <sup>2</sup>Universidade Estadual de Campinas, <sup>3</sup>Sam Higginbottom University of Agriculture, <sup>4</sup>Universidade Federal de Campina Grande

**03.36 ID: 4EFZ - Comparative Study of the Mechanical and Tribological Properties of Recycled and Conventional Filaments in 3D Printing**

Sabrina Miranda de Moraes<sup>1</sup>, Juliana Ricardo de Souza<sup>1</sup>, Ângelo da Silva Carneiro<sup>1</sup>, Ana Tereza de Abreu Lima<sup>1</sup>, Adiana Nascimento Silva<sup>1</sup>; <sup>1</sup>Universidade Federal Rural do Semi

**03.37 ID: 4EYX - A CFD–DEM simulation study of abrasive wear in iron ores slurry controlvalves**

Leandro Ferreira Borba Lima<sup>1</sup>, Eleir Mundim Bortoleto<sup>1</sup>, Jose Jimmy Penagos<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale

**03.38 ID: 4EH2 - Hardness and alumina content determine the Low-Stress Sliding Abrasion wear in commercial ceramics for transfer chute linings?**

Letícia Dias Batista<sup>1</sup>, Maria Aparecida Pinto<sup>2</sup>, Jose Jimmy Penagos<sup>1</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>, Dalila Chaves Sicupira<sup>2</sup>; <sup>1</sup>Instituto Tecnológico Vale, <sup>2</sup>Universidade Federal de Ouro Preto

**03.39 ID: 4FAZ - Impact of grinding stone topography on rail surface integrity**

Lucas Biazon Cavalcanti<sup>1</sup>, Scott Dyball<sup>2</sup>, Roger Lewis<sup>1</sup>; <sup>1</sup>University of Sheffield, <sup>2</sup>British Steel

**03.40 ID: 4EXD - Experimental approaches to system-level identification of tribological parameters in automotive friction torsional vibration dampers**

Michał Formela<sup>1,2</sup>, Jacek Łubiński<sup>1</sup>, Małgorzata Szczerska<sup>1</sup>; <sup>1</sup>Gdansk University of Technology / Politechnika Gdanska, <sup>2</sup>Eaton Mobility Group

**03.41 ID: 4EKJ - Comparison of Abrasive Wear in Conveyor Belt Splices Using Two Experimental Methods**

Natália Lopes Zinato<sup>1</sup>, Yeda Luisa dos Santos<sup>1,2</sup>, Jose Jimmy Penagos<sup>2</sup>, Rafael Dias Pereira<sup>3</sup>, Patrick Falqueto<sup>3</sup>; <sup>1</sup>Universidade Federal de Ouro Preto, <sup>2</sup>Instituto Tecnológico Vale, <sup>3</sup>Vale S/A

**03.42 ID: 4DZQ - Sand-Slurry Erosion of Corrosion-Resistant Alloys at a Shallow Impact Angle**

Natasha Vieira Dantas<sup>1</sup>, Juliana Souza de Oliveira<sup>1</sup>, Rubson Mação Camporez<sup>1</sup>, Sergio Souto Maior Tavares<sup>2</sup>, Cherlio Scandian<sup>1</sup>, Nathan Fantecelle Strey<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>Universidade Federal Fluminense

**03.43 ID: 4EQS - Sclerometry as a method to evaluate the grindability of HSS applied for tap tools**

Saimon Vendrame<sup>1</sup>, Déborah de Oliveira<sup>2</sup>, Washington Martins Silva Junior<sup>3</sup>, Eduardo Carlos Bianchi<sup>4</sup>, Nathan Fantecelle Strey<sup>5</sup>, Alisson Rocha Machado<sup>6</sup>, Rosemar Batista da Silva<sup>3</sup>; <sup>1</sup>Instituto Federal de Educação, Ciência e Tecnologia de São Paulo, <sup>2</sup>Universidade de Brasília, <sup>3</sup>Universidade Federal de Uberlândia, <sup>4</sup>Universidade Estadual Paulista, <sup>5</sup>Universidade Federal do Espírito Santo, <sup>6</sup>Pontifícia Universidade Católica do Paraná

**03.44 ID: 4FAR - Tool Wear Mechanisms when turning Ti-6Al-4V alloy**

Patrick Kwon<sup>1</sup>; <sup>1</sup>San Diego State University

**03.45 ID: 4EPC - Tribological Characterization of Bi-Functional Abrasive Composite**

Paulina Araújo Capela<sup>1</sup>, Sharlane Maria Costa<sup>2,3,4</sup>, Márcia Correia<sup>5</sup>, José Manuel Ramos Gomes<sup>6</sup>, José Carlos Fernandes Teixeira<sup>7</sup>, Mário Antônio Caixeiro Castro Pereira<sup>8</sup>, Delfim Fernandes Soares<sup>2,3</sup>; <sup>1</sup>University of Minho, <sup>2</sup>Center for MicroElectromechanical Systems, <sup>3</sup>Associate Laboratory, <sup>4</sup>Mountain Research Center, <sup>5</sup>Dragão Abrasivos, Lda., <sup>6</sup>Universidade do Minho, <sup>7</sup>Mechanical Engineering and Resource Sustainability Center, <sup>8</sup>Centro de Física das Universidades do Minho e do Porto

**03.46 ID: 4E4K - Abrasiveness and Geology of Brazilian Iron Ores: Considerations Based on the Miller Abrasiveness Test**

Paulo Ricardo Barbosa<sup>1</sup>, Adilson Rodrigues da Costa<sup>1</sup>; <sup>1</sup>Universidade Federal de Ouro Preto

**03.47 ID: 4DZX - Abrasive and erosive wear caused by iron ore slurries with varied silica content on high chromium cast iron: influence of iron ore geology**

Paulo Ricardo Barbosa<sup>1</sup>, Renato Chaves Pereira da Silva<sup>1</sup>, Lucas Diniz Rodrigues Pereira<sup>1</sup>, Gustavo Augusto Rosa Santos<sup>1</sup>, Adilson Rodrigues da Costa<sup>1</sup>; <sup>1</sup>Universidade Federal de Ouro Preto

**03.48 ID: 4EVW - Abrasive wear of conveyor belt rubber materials used in an iron ore processing plant**

Adriano Souza Da Silva<sup>1</sup>, Natália Lopes Zinato<sup>2,3</sup>, Yeda Luisa dos Santos<sup>2,3</sup>, Thalia Gomes dos Santos<sup>3</sup>, Cristian Camilo Viáfara Arango<sup>3</sup>, Jose Jimmy Penagos<sup>3</sup>; <sup>1</sup>Vale S/A, <sup>2</sup>Universidade Federal de Ouro Preto, <sup>3</sup>Instituto Tecnológico Vale

**03.49** ID: 4FBV - A preliminary research of laser DED repairing and its mechanical properties aiming remanufacturing

Yuri TEI<sup>1</sup>, Yoshihisa HARADA<sup>1</sup>, Satoshi KAJINO<sup>1</sup>, Miki NAKANO<sup>1</sup>, Hiroki MANO<sup>1</sup>; <sup>1</sup>Japan Advanced Institute of Science & Technology

## TRACK 07

**Tribology of Extreme Environments: Aero-tribology, Ocean tribology and Space Tribology**

### ORAL PRESENTATIONS

**Monday, September 21**

#### SESSION T07-S01

14:50 – 16:00 • OCEANIA IV

**Session Chair(s):** Ian Sherrington

**14:50 - T07-S01.1**

ID: 4DNS

Keynote Speaker

**Long Life Liquid-Like Solid Lubricants for Extreme Space Environments**

Christopher DellaCorte<sup>1</sup>, Juan Bosch-Giner<sup>1</sup>; <sup>1</sup>University of Akron

**15:20 - T07-S01.2**

ID: 4DMV

Oral presentation

**A self-adaptive supramolecular gel lubricating material for space applications**

Meirong Cai<sup>1</sup>, Feng Zhou<sup>1</sup>, Lijun Weng<sup>1</sup>, Weimin Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**15:40 - T07-S01.3**

ID: 4DSE

Oral presentation

**Evaluation of Al- and Cu-based sacrificial abradable coatings for aerospace applications**

Bruno Edu Arendarchuk<sup>1</sup>, Kaue Bertuol<sup>1</sup>, Francisco Rivadeneira<sup>1</sup>, Barry Barnett<sup>2</sup>, Christian Moreau<sup>3</sup>, Pantcho Stoyanov<sup>3</sup>; <sup>1</sup>Concordia University Montreal, <sup>2</sup>Pratt & Whitney Canada, <sup>3</sup>Concordia University



**SESSION T07-S02**

16:40 – 17:40 • OCEANIA IV

**Session Chair(s):** Peter Lee**16:40 - T07-S02.1**

ID: 4DNJ

Oral presentation

**Special Lubricants and Technologies for Space Science**

Weimin Liu<sup>1</sup>, Lijun Weng<sup>1</sup>, Dapeng Feng<sup>1</sup>, Jiayi Sun<sup>1</sup>, Xiaoming Gao<sup>1</sup>, Ming Hu<sup>1</sup>, Haizhong Wang<sup>1</sup>, Desheng Wang<sup>1</sup>, Dan Qiao<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**17:00 - T07-S02.2**

ID: 4DNK

Oral presentation

**From the Shenzhou-7 Manned Spaceship to the China Space Station: The Tribological Journey of Solid Lubricating Films in Low-Earth Orbit**

Jun He<sup>1</sup>, Desheng Wang<sup>1</sup>, Ming Hu<sup>1</sup>, Xiaoming Gao<sup>1</sup>, Jiayi Sun<sup>1</sup>, Lijun Weng<sup>1</sup>, Weimin Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**17:20 - T07-S02.3**

ID: 4DSD

Oral presentation

**Tribological behavior of Inconel 718 and Cr2O3 coatings in high-temperature steam environments for gas turbine engine applications**

Matheus da Silva Pinto<sup>1</sup>, Andre Renan Mayer<sup>1</sup>, Yinyin Zhang<sup>1</sup>, Christian Moreau<sup>1</sup>, Pantcho Stoyanov<sup>1</sup>; <sup>1</sup>Concordia University

**Tuesday, September 22****SESSION T07-S03**

09:40 – 10:50 • OCEANIA IV

**Session Chair(s):** Hong Liang**09:45 - T07-S03.1**

ID: 4FDH

Invited Speaker

**Invited talk - Amir Kadiric**

Amir Kadiric<sup>1,2</sup>; <sup>1</sup>Imperial College, <sup>2</sup>Imperial College London

**10:10 - T07-S03.2**

ID: 4DSK

Oral presentation

**Spatially Heterogeneous Superwettability in Groove Surfaces: Anchored Plastron for Underwater Drag Reduction**

Zhitao Huang<sup>1</sup>, Yiwei Hu<sup>1</sup>, Zhaoxi Liang<sup>1</sup>, Shicai Zhu<sup>1</sup>, Jianbin Luo<sup>2,1</sup>, Liran Ma<sup>1</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Tsinghua University China

**10:30 - T07-S03.3**

ID: 4EKP

Oral presentation

**Dynamics of Cage-free Ball Bearings under acceleration condition**

Wei Cao<sup>1</sup>, Cheng Chang<sup>1</sup>; <sup>1</sup>Sichuan University

**SESSION T07-S04**

11:30 – 12:30 • OCEANIA IV

**Session Chair(s):** Weimin Liu**11:30 - T07-S04.1**

ID: 4DV6

Oral presentation

**Friction-Induced Nonequilibrium Phase Transformation of Low-Temperature Ice**Hong Liang<sup>1</sup>, Jean Michel Martin<sup>2</sup>; <sup>1</sup>Texas A&M University, <sup>2</sup>Ecole Centrale de Lyon**11:50 - T07-S04.2**

ID: 4DVD

Oral presentation

**Influence of Lead on the Tribological Performance and Wear Mechanisms of CuSn-Based Coatings**Toukir Ahmed<sup>1</sup>, Andre Renan Mayer<sup>1</sup>, Amit Roy<sup>1</sup>, Maya Harfouche<sup>2</sup>, Barry Barnett<sup>3</sup>, Richard R. Chromik<sup>2</sup>, Christian Moreau<sup>1</sup>, Pantcho Stoyanov<sup>1</sup>; <sup>1</sup>Concordia University, <sup>2</sup>McGill University, <sup>3</sup>Pratt & Whitney Canada**12:10 - T07-S04.3**

ID: 4F6F

Oral presentation

**Effects of Hydrogen Aging on the Tribology of Molybdenum Disulfide (MoS<sub>2</sub>)**Craig Barbour<sup>1</sup>, Catherine Fidd<sup>2</sup>, Kylie E. Van Meter<sup>3</sup>, Santiago Lazarte<sup>2</sup>, Christian Micko<sup>2</sup>, Julian Long<sup>1,2</sup>, Adam Delong<sup>2</sup>, Tomas F. Babuska<sup>3</sup>, John F. Curry<sup>3</sup>, Nicolas Argibay<sup>4</sup>, Brandon A. Krick<sup>1,2</sup>; <sup>1</sup>Florida Agricultural & Mechanical University, <sup>2</sup>Florida State University, <sup>3</sup>Sandia National Laboratories, <sup>4</sup>Ames National Laboratory**SESSION T07-S05**

14:40 – 16:00 • OCEANIA IV

**Session Chair(s):** Weimin Liu**14:40 - T07-S05.1**

ID: 4FBF

Oral presentation

**Fretting Wear of High-Temperature Coatings in Flat-on-Flat Contacts for Gas Turbine Blade Tip Applications**Mario Lavella<sup>1</sup>, DANIELE BOTTO<sup>2</sup>; <sup>1</sup>Università degli Studi di Bergamo, <sup>2</sup>Politecnico di Torino**15:00 - T07-S05.2**

ID: 4DWQ

Oral presentation

**Tailoring Mechanical and Tribological Performance of Fabric Composites via Microcapsule Size Design**Chaoying Liao<sup>1</sup>, Mingming Yang<sup>1</sup>, Zhaozhu Zhang<sup>1</sup>, Weimin Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences**15:20 - T07-S05.3**

ID: 4DXC

Oral presentation

**Concept of Steady-State Fluid Drag Reduction Based on Biomimetic Superhydrophilic Interfaces**Wufang Yang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences**15:40 - T07-S05.4**

ID: 4DXV

Oral presentation

**Polysilazane-Based Multifunctional Integrated Coating**Bo Yu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences**Wednesday, September 23**

**SESSION T07-S07**

09:40 – 10:50 • OCEANIA IV

**Session Chair(s):** JAVIER BARRIGA**09:45 - T07-S07.1**

ID: 4DTE

Invited Speaker

**Simple Methods for Predicting Mixed and Boundary Friction**Ian Sherrington<sup>1</sup>, Robert Ian Taylor<sup>1</sup>; <sup>1</sup>University of Lancashire**10:10 - T07-S07.2**

ID: 4DZR

Oral presentation

**Multiscale Modelling of Rain Droplet Impact on Wind Turbine Blades**Vinayak Ramachandran Nambiar<sup>1</sup>, Joris Degroote<sup>1,2</sup>, Wim De Waele<sup>1,2</sup>, Dieter Fauconnier<sup>1,2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Flanders Make**10:30 - T07-S07.3**

ID: 4E2K

Oral presentation

**The formation mechanism, diffusion behavior, properties of the material transfer layer on the rail surface during ultra-high speed sliding electrical contact**Deshan Chen<sup>1</sup>, Pingping Yao<sup>1</sup>, Xing Wang<sup>1</sup>, Yuxuan Xu<sup>1</sup>, Ziyi Liu<sup>1</sup>, Weiha Liang<sup>1</sup>; <sup>1</sup>Central South University (Zhongnan University)**SESSION T07-S08**

11:30 – 12:30 • OCEANIA IV

**Session Chair(s):** Nazanin Emami**11:30 - T07-S08.1**

ID: 4E4T

Oral presentation

**Preparation and Evaluation of Protective Coatings for Aeroengine Blade Tips**Shuai Yang<sup>1</sup>, Bi Wu<sup>2</sup>, Siyang Gao<sup>2</sup>, Weihai Xue<sup>2</sup>, Deli Duan<sup>3</sup>; <sup>1</sup>Institute of Metal Research, Chinese Academy of Sciences, <sup>2</sup>Institute of Metal Research, Chinese Academy of Sciences, <sup>3</sup>Institute of Metal Research, Chinese Academy of Sciences**11:50 - T07-S08.2**

ID: 4E6Y

Oral presentation

**Morphology-Regulated MoS<sub>2</sub>/MWCNTs Hybrids for Enhanced Tribological and Mechanical Performance of PEEK Composites under Harsh Environments**Suling Huang<sup>1</sup>, Dan Jia<sup>1</sup>, Shengpeng Zhan<sup>1</sup>, Tian Yang<sup>1</sup>, Haitao Duan<sup>1</sup>, Xiaoshuang Luo<sup>1</sup>, Haitao Duan<sup>1</sup>; <sup>1</sup>State Key Laboratory of Special Materials Surface Engineering, China Academy of Machinery Wuhan Research Institute of Materials Protection Co., Ltd.,**12:10 - T07-S08.3**

ID: 4EAC

Oral presentation

**Erosion performance of AISi-based abradable coating**Natália de Oliveira Sousa<sup>1</sup>, Bruno Edu Arendarchuck<sup>1</sup>, Francisco Rivadeneira<sup>1</sup>, Barry Barnett<sup>2</sup>, Kaue Bertuol<sup>1</sup>, Pantcho Stoyanov<sup>1</sup>; <sup>1</sup>Concordia University Montreal, <sup>2</sup>Pratt & Whitney Canada

**SESSION T07-S09**

14:40 – 16:00 • OCEANIA IV

**Session Chair(s):** Qin Zhao**14:40 - T07-S09.1**

ID: 4EAD

Oral presentation

**Exploring boron nitride nanotubes as reinforcement to Co-TiC sintered composites at high-temperature wear against Si<sub>3</sub>N<sub>4</sub> ball counterpart**Oleksandr Tisov<sup>1</sup>, Yurchuk Alina<sup>2</sup>; <sup>1</sup>Xi'an Jiaotong University, <sup>2</sup>State University Kyiv Aviation Institute**15:00 - T07-S09.2**

ID: 4EB2

Oral presentation

**Reducing the humidity dependence of friction and wear of graphite-based solid lubricant coatings**Martin Dienwiebel<sup>1</sup>, Omar Zouina<sup>2</sup>, Alexandros Lappas<sup>2</sup>, Andreas Klemenz<sup>3</sup>, Michael Moseler<sup>3</sup>; <sup>1</sup>Microtribology Centre, <sup>2</sup>Karlsruhe Institute of Technology, <sup>3</sup>Fraunhofer Institute for Mechanics of Materials**15:20 - T07-S09.3**

ID: 4EDG

Oral presentation

**Exploration of Adaptive Tribological Surfaces for Aerospace Applications with In-situ Raman Analysis**Andrey A Voevodin<sup>1</sup>, Diana Berman<sup>1</sup>, Samir M Aouadi<sup>1</sup>; <sup>1</sup>University of North Texas**SESSION T07-S10**

16:40 – 17:40 • OCEANIA IV

**Session Chair(s):** Amir Kadiric**16:40 - T07-S10.1**

ID: 4EEA

Oral presentation

**Contact pressure tribological effect on Bi<sub>2</sub>S<sub>3</sub>-MoS<sub>2</sub> soft coatings**Gaston Romero Pietrafesa<sup>1,2</sup>, Martina Pradilla<sup>1</sup>, Walter Roberto Tuckart<sup>1,2</sup>, Germán Prieto<sup>1,2</sup>; <sup>1</sup>Universidad Nacional del Sur, <sup>2</sup>Instituto de Física del Sur**17:00 - T07-S10.2**

ID: 4EEW

Oral presentation

**Flow Transport and Film Evolution of Lubricant on a Rotating Disk Across a Broad Temperature Region**Chunhui Wei<sup>1</sup>, Daniel Nelias<sup>2</sup>, Valery Botton<sup>3</sup>, Wei Wu<sup>1</sup>, Yi Liu<sup>1</sup>; <sup>1</sup>Beijing Institute of Technology, <sup>2</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>3</sup>Institut National des Sciences Appliquées de Lyon**17:20 - T07-S10.3**

ID: 4EJY

Oral presentation

**Effect of Sodium Sulfate on Wear of Stainless Steel in High-Temperature and High-Pressure Water-Containing Ethanol Environment**Hiroto Kawai<sup>1</sup>, Takayuki Tokoroyama<sup>1</sup>, Noritsugu Umehara<sup>1</sup>, Ruixi Zhang<sup>2</sup>; <sup>1</sup>Nagoya University, <sup>2</sup>Institute of Science Tokyo**Thursday, September 24**

**SESSION T07-S11**

09:30 – 10:50 • OCEANIA IV

**Session Chair(s):** Henara Lillian Costa**09:30 - T07-S11.1**

ID: 4EMY

Oral presentation

**High-temperature fretting wear behavior of established Tribaloys and a newly developed high-entropy alloy of reduced Cobalt content**Nora Kind<sup>1</sup>, Johannes Walz<sup>1</sup>; <sup>1</sup>German Aerospace Center**09:50 - T07-S11.2**

ID: 4EPN

Oral presentation

**Glazing of C263 Nickel Superalloy at Extreme Temperatures**Joseph P Harrison<sup>1</sup>, Matthew B Marshall<sup>1</sup>, Kate Tomlinson<sup>1</sup>; <sup>1</sup>University of Sheffield**10:30 - T07-S11.4**

ID: 4EWX

Oral presentation

**Influence of Hydrogen on the Tribological Behavior of Cast Iron Block/Piston Ring Contacts: First Insights**Miguel Angel Narvaez Ardila<sup>1</sup>, Thiago de Oliveira Santos<sup>2,1</sup>, Taina Luana da Silva<sup>2</sup>, Bruno Sousa Carneiro da Cunha<sup>2</sup>, Regina Paula Garcia<sup>2,1</sup>, Leonardo Rosa Ribeiro da Silva<sup>2,1</sup>; <sup>1</sup>Laboratorio de Tecnologia em Atrito e Desgaste, <sup>2</sup>Universidade Federal de Uberlândia**SESSION T07-S12**

11:30 – 12:30 • OCEANIA IV

**Session Chair(s):** Alice MARINESCU**11:30 - T07-S12.1**

ID: 4EYA

Oral presentation

**Experimental investigation of wear behaviour and debris evacuation in an aerospace-grade material pair under high-temperature conditions**Alice MARINESCU<sup>1</sup>, Marine MENUT<sup>2</sup>, Aurélien SAULOT<sup>1</sup>, Lionel LAFARGE<sup>1</sup>, Benyebka BOU-SAÏD<sup>1</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Engineering Center for Health, Experimental and Computational Tribology**11:50 - T07-S12.2**

ID: 4EZ6

Oral presentation

**Tribological behavior of a a-C coated AISI 4340 under seawater lubricated conditions for Oil and Gas Injection Valves**André Dantas Freire<sup>1</sup>, Larissa Solano de Almeida<sup>1</sup>, Miguel Rubira Danelon<sup>1</sup>, Izabel Fernanda Machado<sup>1</sup>, Roberto Martins de Souza<sup>1</sup>, Newton Kiyoshi Fukumasu<sup>1</sup>; <sup>1</sup>Universidade de São Paulo**POSTER PRESENTATIONS****Wednesday, September 23**

**SESSION Poster 04**

16:00 – 16:40 • America

**04.1 ID: 4DQK - Component-level wear and friction investigation of polymer packing seals exposed to Lunar and Martian regolith simulants**

Ádám Kalácska<sup>1</sup>, Patrick De Baets<sup>1</sup>, Róbert Keresztes<sup>2</sup>, György Barkó<sup>2</sup>, Gábor Kalácska<sup>2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Hungarian University of Agriculture and Life Sciences

**04.2 ID: 4EBQ - Solid Particle Erosion of Plasma-nitrided DLC-coated Superduplex 2507 Stainless Steel and Inconel 718**

Bruno Corveto Bragança<sup>1</sup>, Julia Mazzoni Moura<sup>1</sup>, Rubson Mação Camporez<sup>1</sup>, Newton Kiyoshi Fukumasu<sup>2</sup>, ANDRÉ PAULO TSCHIPTSCHIN<sup>2</sup>, Nathan Fantecelle Strey<sup>1</sup>, Cherlio Scandian<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>Universidade de São Paulo

**04.3 ID: 4FBB - Tribological Properties and Space Environment Effects of Metal dichalcogenide Lubricating Films**

Desheng Wang<sup>1</sup>, Jun He<sup>1</sup>, Jiayi Sun<sup>1</sup>, Weimin Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**04.4 ID: 4EPD - Scratch Adhesion Resistance of DLC Coatings on 2507 Superduplex Stainless Steel and Inconel 718 by PVD and PECVD**

Rubson Mação Camporez<sup>1</sup>, Fernando Gante Maia de Sousa<sup>2</sup>, Fagner Marçal Andrade<sup>3</sup>, Newton Kiyoshi Fukumasu<sup>4</sup>, ANDRÉ PAULO TSCHIPTSCHIN<sup>4</sup>, Roberto Martins de Souza<sup>4</sup>, Dante Ferreira Franceschini Filho<sup>3</sup>, Nathan Fantecelle Strey<sup>2</sup>, Cherlio Scandian<sup>2</sup>; <sup>1</sup>UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO, <sup>2</sup>Universidade Federal do Espírito Santo, <sup>3</sup>Universidade Federal Fluminense, <sup>4</sup>Universidade de São Paulo

**04.5 ID: 4E6K - Design of an Experimental Setup for Quantifying High-Velocity Droplet Impact Forces**

Jean Carlos Poletto<sup>1,2</sup>, Patrick De Baets<sup>1,3,2</sup>, Dieter Fauconnier<sup>1,2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Flanders Make, <sup>3</sup>Royal Institute of Technology / Kungliga Tekniska Högskolan

**04.6 ID: 4DNB - Time accumulation effect on multiscale contact transient modeling to piston pump with in mixed lubrication**

Jian FU<sup>1</sup>; <sup>1</sup>Beihang University (Beijing University of Aeronautics and Astronautics)

**04.7 ID: 4EAV - Evolution of Friction and Wear Mechanisms of Aerospace sealing Rubber under Thermal–Oxidative Aging**

Qiandiao Wei<sup>1,2</sup>, Jian Wu<sup>1,2</sup>, Zhihao Chen<sup>1,2</sup>, Benlong Su<sup>1,2</sup>, Youshan Wang<sup>1</sup>; <sup>1</sup>Harbin Institute of Technology, <sup>2</sup>Harbin Institute of Technology at Weihai

**04.8 ID: 4ESW - Engineered Surfaces and Functional Additives for Extreme-Condition and Sustainable Tribological Applications: A Review**

Hariharasakthisudhan Ponnarengan<sup>1</sup>, SATHICKBASHA KATHARBASHA<sup>2</sup>, Jitendra Kumar Katiyar<sup>3</sup>; <sup>1</sup>Dr. Mahalingam College of Engineering and Technology, Pollachi, India 642003., <sup>2</sup>B S Abdur Rahman Crescent Institute of Science and Technology, Vandalur, Chennai 48., <sup>3</sup>Manipal Institute of Technology, Manipal

**04.9 ID: 4EAB - Abrasive Wear of High Density Polyethylene for Offshore Applications**

Karoline Sales de Oliveira Gusmão<sup>1</sup>, Thiago Doca<sup>1</sup>; <sup>1</sup>University of Brasilia

**04.10** (ID: 4EMW) - **Design of Novel Grease-Based Ultralow Friction and Wear Systems and Their Study in Space Lubrication**

Liqiang Zhang<sup>1</sup>, Daoai Wang<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**04.11** (ID: 4EYB) - **Friction and Wear Performance of SAE 1070 Steel in Air and Seawater for Flexible Riser Applications**

Lucia Vieira<sup>1</sup>, JOSE FLAVIO PEREIRA GONDIM JUNIOR<sup>2</sup>, Julia M. de A. Abdala<sup>2</sup>; <sup>1</sup>Instituto Tecnológico de Aeronáutica, <sup>2</sup>Universidade do Vale do Paraíba

**04.12** (ID: 4DXR) - **Biomimetic “soft-hard-soft” gradient interface engineering: multi-stage structural synergies and dual-layer tribofilm modulation for enhanced tribological properties of CF/PTFE composites**

Yue Zhang<sup>1</sup>, Mingming Yang<sup>1</sup>, Zhaozhu Zhang<sup>1</sup>, Weimin Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**04.13** (ID: 4E2B) - **Lubrication materials for advanced nuclear reactors**

Peng Wang<sup>1</sup>, Liqiang Chai<sup>1</sup>, Beibei Zhang<sup>1</sup>, Weimin Liu<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**04.14** (ID: 4DXZ) - **Vat photopolymerization 3D printable self-lubricating polyimide**

Xiaolong Wang<sup>1</sup>; <sup>1</sup>Lanzhou Institute of Chemical Physics

**04.15** (ID: 4ENB) - **Regulation of High-Temperature Adhesion and Static Friction Behaviors of Superalloys via Surface Topography Control**

Yuhui Zou<sup>1</sup>, Bingxue Cheng<sup>1</sup>, Tianmin Shao<sup>2</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Tsinghua University China

## TRACK 08

### Biotribology, Biomimetics & Food Tribology.

## ORAL PRESENTATIONS

**Monday, September 21**

### SESSION PJA01

14:00 – 14:40 • EUROPA III-IV

**Session Chair(s):** Nicholas Spencer

**14:00 - PJA01.1** (ID: 4DY2) (Peter Jost Award)

**Harmonious Tribo-Interfaces Enabled by Soft Matters**

Feng Zhou<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**SESSION T08-S01**

14:50 – 16:00 • OCEANIA V

**Session Chair(s):** Markus Wimmer**14:50 - T08-S01.1**

ID: 4DXW

Keynote Speaker

**LipoGels: Robust self-lubricating physically cross-linked alginate hydrogels embedded with liposomes**Wuge Briscoe<sup>1</sup>; <sup>1</sup>Bristol University**15:20 - T08-S01.2**

ID: 4DMZ

Oral presentation

**Towards Understanding the Protective Lubrication Mechanisms of Mucous Layers**Samuel Shari Gamaniel<sup>1</sup>, David T.A. Matthews<sup>1</sup>, Matt J. Carré<sup>2</sup>, Roger Lewis<sup>2</sup>, Emile van der Heide<sup>1</sup>; <sup>1</sup>University of Twente / Universiteit Twente, <sup>2</sup>University of Sheffield**15:40 - T08-S01.3**

ID: 4DNN

Oral presentation

**Bio-Inspired Hierarchical Laser Texturing for Enhanced Tribological Performance of Aluminum Alloys**Mohamed Abid<sup>1</sup>, Fatma Elwasli<sup>2</sup>, Slah Mzali<sup>2</sup>, Salah Mezlini<sup>2</sup>, Karl Delbé<sup>1</sup>; <sup>1</sup>Université de Technologie de Tarbes, <sup>2</sup>École Nationale d'Ingénieurs de Monastir**SESSION T08-S02**

16:40 – 17:40 • OCEANIA V

**Session Chair(s):** Wuge Briscoe**16:40 - T08-S02.1**

ID: 4DNV

Oral presentation

**Investigation of tactile perceptual descriptors by vibrotactile rendering**Livia Felicetti<sup>1,2</sup>, Serena Michetti<sup>1</sup>, Mihaela Juganaru<sup>3</sup>, Jenny Faucheu<sup>3</sup>, Eric Chatelet<sup>2</sup>, Francesco Massi<sup>1</sup>; <sup>1</sup>Università degli Studi di Roma La Sapienza, <sup>2</sup>Institut national des Science Appliquées de Lyon, <sup>3</sup>École Nationale Supérieure des Mines de Saint Étienne**17:00 - T08-S02.2**

ID: 4DPP

Oral presentation

**A Customized Tribometer for Assessing Cartilage Tribological Behavior Under Physiologically Representative Knee Joint Loading**Haytam Kasem<sup>1</sup>; <sup>1</sup>Azrieli College of Engineering**17:20 - T08-S02.3**

ID: 4DRG

Oral presentation

**Exploring the Application of Nonlinear Analysis Methods in Studying Friction in Dental Glass-Ionomer Cements**Magdalena Lepicka<sup>1</sup>, Gabriela Rafalko<sup>1</sup>, Magdalena Rodziejewicz-Weremczuk<sup>1</sup>, Romuald Mosdorf<sup>1</sup>; <sup>1</sup>Białystok University of Technology**Tuesday, September 22**



**SESSION P03**

08:30 – 09:30 • EUROPA III-IV

**Session Chair(s):** Marcelo Braga dos Santos**08:30 - P03.1**

ID: 4FCJ

Plenary Speaker

**Biolubrication: from basics to applications**Jacob Klein<sup>1</sup>; <sup>1</sup>Weizmann Institute of Science**SESSION T08-S03**

09:40 – 10:50 • OCEANIA V

**Session Chair(s):** Feng Zhou**09:40 - T08-S03.1**

ID: 4EQJ

Keynote Speaker

**A Multi-Station Rolling–Gliding Apparatus to Evaluate Cartilage Wear for Hemiarthroplasty**Francesca de Vecchi<sup>1</sup>, Victoria Marino<sup>2,1</sup>, Luca Tortoreto<sup>2,1</sup>, Thomas M. Schmid<sup>1</sup>, Douglas Van Citters<sup>3</sup>, Joseph J. Crisco<sup>4</sup>, Markus Wimmer<sup>1</sup>; <sup>1</sup>Rush University Medical Center, <sup>2</sup>University of Illinois Chicago, <sup>3</sup>Dartmouth College, <sup>4</sup>Brown University**10:10 - T08-S03.2**

ID: 4DRX

Oral presentation

**In-Vitro Testing of Amorphous Carbon Coated Implants in a Servohydraulic Knee Simulator**Kevin Neusser<sup>1</sup>, Manuel Kistler<sup>2</sup>, Matthias Woiczinski<sup>3,2</sup>, Sandro Wartack<sup>4</sup>, Benedict Rothhammer<sup>5</sup>; <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, Engineering Design, <sup>2</sup>Musculoskeletal University Center Munich, <sup>3</sup>Friedrich Schiller Universität Jena, <sup>4</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, <sup>5</sup>Friedrich Alexander Universität Erlangen Nürnberg**10:30 - T08-S03.3**

ID: 4DSF

Oral presentation

**Surface-Grafted Polymers for Adhesion and Friction Control**Bin Li<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences**SESSION T08-S04**

11:30 – 12:30 • OCEANIA V

**Session Chair(s):** Rosa M Espinosa-Marzal**11:30 - T08-S04.1**

ID: 4DTF

Oral presentation

**Non-invasive Characterisation of Skin Mechanics and the Effects of Menopause and Ageing**Margarida M.L.D Santos<sup>1</sup>, Michael J. Sherratt<sup>2</sup>, Robert Irwin<sup>3</sup>, Marc Masen<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Manchester, <sup>3</sup>No7 Beauty Company**11:50 - T08-S04.2**

ID: 4DTW

Oral presentation

**Frictional Shear Stress Drives Particle Transport in Cartilage-like Hydrogels**Ahmed Al Kindi<sup>1</sup>, Nemea Courelli<sup>1</sup>, Shawn Yeom<sup>1</sup>, Michael Bryant<sup>2</sup>, Angela A. Pitenis<sup>1</sup>; <sup>1</sup>University of California Santa Barbara, <sup>2</sup>University of Birmingham

**12:10 - T08-S04.3**

ID: 4EFQ

Oral presentation

**Side-group-mediated friction of amphiphilic copolymer-doped hydrogels**Panpan Zhao<sup>1</sup>, Xinyuan Ye<sup>1</sup>, Jacob Klein<sup>1</sup>; <sup>1</sup>Weizmann Institute of Science**SESSION T08-S05**

14:50 – 16:00 • OCEANIA V

**Session Chair(s):** Jacob Klein**14:55 - T08-S05.1**

ID: 4DMH

Invited Speaker

**Gradients in Mucin: The Tear Film's Trick for Shear Invariance via Expanding Shear Zones**W. Gregory Sawyer<sup>1</sup>; <sup>1</sup>Moffitt Cancer Center**15:20 - T08-S05.2**

ID: 4DRW

Oral presentation

**Numerical Simulation of Third-Body Wear in Total Knee Replacements**Klara Feile<sup>1</sup>, Sandro Wartzack<sup>1</sup>, Benedict Rothhammer<sup>2</sup>; <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, <sup>2</sup>Friedrich Alexander Universität Erlangen Nürnberg**15:40 - T08-S05.3**

ID: 4DYD

Oral presentation

**Role of membrane associated mucins (MAMs) in boundary lubrication of corneal surface**Prashant Kumar Sharma<sup>1</sup>, Yong Chen<sup>1</sup>, Theo G. van Kooten<sup>1</sup>; <sup>1</sup>University Medical Center Groningen**SESSION T08-S06**

16:40 – 17:40 • OCEANIA V

**Session Chair(s):** Magdalena Lepicka**16:40 - T08-S06.1**

ID: 4DZ4

Oral presentation

**Biomimetic Design of MOFs-based Arthritis Lubricating Nanocarriers**Jianxi Liu<sup>1</sup>, Lejie Tian<sup>1</sup>; <sup>1</sup>Northwestern Polytechnical University**17:00 - T08-S06.2**

ID: 4DZH

Oral presentation

**Enhancing Tribological Performance and Wettability of Snakeskin-Inspired Surfaces via PDLLA Nanosheets**Mohd Danial Ibrahim<sup>1</sup>, Ir. Sitti Aishah Najamudin<sup>1</sup>, Endu Yollanda Jubilee<sup>1</sup>, Dayang Salyani Abang Mahmod<sup>1</sup>, Pierre Barroy<sup>2</sup>, Anna Cantaluppi<sup>2</sup>, Michael Lejeune<sup>2</sup>, Andreas Zeinert<sup>2</sup>, Yuta Sunami<sup>3</sup>, Abang Mohammad Nizam Abang Kamaruddin<sup>1</sup>, Ahmad Beng Hong Kueh<sup>1</sup>, M Azlan B Masod<sup>4</sup>; <sup>1</sup>Universiti Malaysia Sarawak, <sup>2</sup>Universite Picardie Jules Verne, <sup>3</sup>Sunami Co. Ltd., <sup>4</sup>Petronas Research Sdn Bhd**17:20 - T08-S06.3**

ID: 4EFB

Oral presentation

**Active control of finger sliding friction with different surface roughness in SDS solutions for underwater surface haptics**Xue Zhou<sup>1</sup>; <sup>1</sup>Sichuan University**Wednesday, September 23****SESSION T08-S07**

09:40 – 10:50 • OCEANIA V

**Session Chair(s):** Mark Rutland

**09:45 - T08-S07.1**

ID: 4DQT

Invited Speaker

**Lubrication in Charged Hydrogels: Hydration Lubrication vs. Electrostatics**

Rosa M Espinosa-Marzal<sup>1</sup>, Ming Jun Lee<sup>1</sup>, Isha Bordawekar<sup>1</sup>; <sup>1</sup>University of Illinois Urbana Champaign

**10:10 - T08-S07.2**

ID: 4E2Y

Oral presentation

**A Novel Biomimetic Strategy for Improving Lubrication Performances of UHMWPE Inspired by the Slippery gel Release Behavior of Chia Seeds**

Conglin Dong<sup>1</sup>, Zhanmo Zheng<sup>1</sup>, Xiuqin Bai<sup>1</sup>, Chengqing Yuan<sup>1</sup>, Zhiwei Guo<sup>1</sup>, Yan Zhang<sup>1</sup>; <sup>1</sup>Wuhan University of Technology

**10:30 - T08-S07.3**

ID: 4EAH

Oral presentation

**Friction and Wear Behavior of Sustainable Microfibrillated Cellulose/Poly(lactic Acid) Hybrid Coatings with Antiviral Activity**

Ke Ren<sup>1</sup>, Zhenyu Jason Zhang<sup>1</sup>; <sup>1</sup>University of Birmingham

## SESSION T08-S08

11:30 – 12:30 • OCEANIA V

**Session Chair(s):** Margarida M.L.D Santos

**11:30 - T08-S08.1**

ID: 4EMC

Oral presentation

**Exotic Tribology of Soft Interfaces – Chocolates to Contact Lenses**

Kartik Pondicherry<sup>1</sup>, Paul Staudinger<sup>1</sup>; <sup>1</sup>Anton Paar GmbH

**11:50 - T08-S08.2**

ID: 4EAT

Oral presentation

**Needle Insertion Induced Fracture and Friction in Biomimetic Soft Gels**

CHITHIRA RAVINDRAN<sup>1</sup>, MUTHUKUMAR MARIAPPAN<sup>1</sup>, Musuvathi Santhapariipoornam Bobji<sup>2</sup>, K R Y Simha<sup>2</sup>; <sup>1</sup>Acharya Institute of Technology, <sup>2</sup>Indian Institute of Science Bangalore

**12:10 - T08-S08.3**

ID: 4EAW

Oral presentation

**Ti-6Al-4V/HAp/MXene surface architectures for low-friction, osteointegrative biomaterials**

Agnieszka Maria TOMALA<sup>1</sup>, Edyta Kosińska<sup>1</sup>, Julia Sadlik<sup>1</sup>, Martina Markunović<sup>2</sup>, Pierluigi Bilotto<sup>2</sup>, Hakan Göçerler<sup>2</sup>, Agata Tomaszewska<sup>3</sup>, Agnieszka Krupa<sup>3</sup>, Carsten Gachot<sup>2</sup>; <sup>1</sup>Cracow University of Technology, <sup>2</sup>Technische Universität Wien, <sup>3</sup>University of Lodz

## SESSION T08-S09

14:40 – 16:00 • OCEANIA V

**Session Chair(s):** Urban Wiklund

**14:40 - T08-S09.1**

ID: 4EAX

Oral presentation

**Tribocorrosion Behaviour of Additively Manufactured Ti6Al4V with Targeted Surface Structures under Synovial Fluid Degradation**

Lukáš Odehnal<sup>1</sup>, Anna Neus Igual-Muñoz<sup>2</sup>, Stefano Mischler<sup>2</sup>, Martin Vrbka<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>École Polytechnique Fédérale de Lausanne

**15:00 - T08-S09.2**

ID: 4EBN

Oral presentation

**Response of PVA Hydrogels in the Boundary Lubrication Regime after Loss of Fluid Pressurization**

Daniel Nemecek<sup>1</sup>, David Necas<sup>1</sup>, SHINMORI HIRONORI<sup>2</sup>, Seido Yarimitsu<sup>2</sup>, Max Marian<sup>3,4</sup>, Martin Vrbka<sup>1</sup>, Yoshinori Sawae<sup>2</sup>, Ivan Krupka<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>Kyushu University, <sup>3</sup>Pontificia Universidad Católica de Chile, <sup>4</sup>Leibniz University Hannover

**15:20 - T08-S09.3**

ID: 4ECG

Oral presentation

**Modified pHEMA hydrogels as cartilage biomimetic materials**

David Rebenda<sup>1</sup>, Petr Čípek<sup>1</sup>, Ivana Chamradova<sup>2</sup>, Monika Trudicova<sup>2</sup>, Jan Kotoucek<sup>2</sup>, Pavel Cipek<sup>1</sup>, Zuzana Kadlecova<sup>2</sup>, Lucy Vojtova<sup>2</sup>, Martin Vrbka<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>Central European Institute of Technology

**15:40 - T08-S09.4**

ID: 4ECK

Oral presentation

**Ensuring Adhesion to a Wet Interface: the case of a Mushroom Shaped Microstructure**

Luciana Nasca<sup>1</sup>, Michele Santeramo<sup>1</sup>, Carmine Putignano<sup>1</sup>, Elena Pierro<sup>1</sup>, Giuseppe Carbone<sup>2</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Nanjing University of Science & Technology

**SESSION T08-S10**

16:40 – 17:40 • OCEANIA V

**Session Chair(s):** Agnieszka Maria TOMALA**16:40 - T08-S10.1**

ID: 4ED2

Oral presentation

**Do MXenes miss their MAX phases? Study on surface adhesion and interaction of Ti3C2Tx MXenes on porous and laser textured substrates**

Hakan Göçerler<sup>1</sup>, Pierluigi Bilotto<sup>1</sup>, Agnieszka Maria TOMALA<sup>2</sup>, Andreas Rosenkranz<sup>3</sup>, Michael Naguib<sup>4</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>Cracow University of Technology, <sup>3</sup>Universidad de Chile, <sup>4</sup>Tulane University

**17:00 - T08-S10.2**

ID: 4EES

Oral presentation

**MXene-Reinforced CoCrMo Composites for Advanced Biotribological Applications**

David Necas<sup>1</sup>, Daniel Nemecek<sup>1</sup>, Jan Radil<sup>1</sup>, Max Marian<sup>2,3</sup>, Martin Vrbka<sup>1</sup>, Ivan Krupka<sup>1</sup>, Martin Hartl<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>Pontificia Universidad Católica de Chile, <sup>3</sup>Leibniz University Hannover

**17:20 - T08-S10.3**

ID: 4EDM

Oral presentation

**Solid lubrication in an insect joint: a comprehensive experimental and numerical investigation**

Carmine Putignano<sup>1</sup>, Konstantin Nadein<sup>2</sup>, Julian Thomas<sup>2</sup>, Stanistav Gorb<sup>2</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Christian Albrechts Universität zu Kiel

**Thursday, September 24**

**SESSION T08-S11**

09:45 – 10:50 • OCEANIA V

**Session Chair(s):** W. Gregory Sawyer**09:45 - T08-S11.1**

ID: 4DVT

Invited Speaker

**Assembly of lipid–hyaluronan complexes in osteoarthritic conditions: bulk structure, tribology and surface films**Mark Rutland<sup>1</sup>, Kangdi Sun<sup>2</sup>, Tooba Shaib<sup>3</sup>, Changwoo Do<sup>3</sup>, Rosa M Espinosa-Marzal<sup>2</sup>; <sup>1</sup>Royal Institute of Technology / Kungliga Tekniska Högskolan, <sup>2</sup>University of Illinois Urbana Champaign, <sup>3</sup>Oakridge National Laboratory**10:10 - T08-S11.2**

ID: 4EXA

Oral presentation

**Pressure-Driven Microstructural Evolution and Tribological Response of CoCrMo Orthopaedic Bearings**Edona Hyla<sup>1</sup>, Andrew Robert Beadling<sup>1</sup>, Michael Bryant<sup>1</sup>, Richard M Hall<sup>1</sup>, Gregory de Boer<sup>2</sup>; <sup>1</sup>University of Birmingham, <sup>2</sup>University of Leeds**10:30 - T08-S11.3**

ID: 4EGQ

Oral presentation

**Multilamellar Vesicle Architecture: Linking Bilayer Stacking and Interlamellar Spacing to Membrane Mechanics**Maria Kaeek<sup>1</sup>, Jacob Klein<sup>1</sup>; <sup>1</sup>Weizmann Institute of Science**SESSION T08-S12**

11:30 – 12:30 • OCEANIA V

**Session Chair(s):** Maria Kaeek**11:30 - T08-S12.1**

ID: 4EGW

Oral presentation

**Tribologically induced mechanisms of articular cartilage lubrication**Petr Čípek<sup>1</sup>, David Rebenda<sup>1</sup>, Pavel Cipek<sup>1</sup>, Ivana Chamradova<sup>2</sup>, Lucy Vojtova<sup>2</sup>, Martin Vrbka<sup>1</sup>; <sup>1</sup>Brno University of Technology, <sup>2</sup>Central European Institute of Technology**11:50 - T08-S12.2**

ID: 4EGY

Oral presentation

**Influence of Mixed Mesh-Size Network on Friction in Hydrogel Contacts**Seona Elizabeth Rodger Mauchline<sup>1</sup>, Samuel James Richards<sup>1</sup>, Jamal Umer<sup>1</sup>, Andrew Robert Beadling<sup>1</sup>, Angela A. Pitenis<sup>2</sup>, Michael Bryant<sup>1</sup>; <sup>1</sup>University of Birmingham, <sup>2</sup>University of California Santa Barbara**12:10 - T08-S12.3**

ID: 4EHE

Oral presentation

**Rheometer- based tribology of Hemiarthroplasty Bearing Materials**Dominik Jonas Federl<sup>1</sup>, Mohammed Abualia<sup>2</sup>, Markus Wimmer<sup>2</sup>, Carsten Gachot<sup>3</sup>; <sup>1</sup>Austrian Institute of Technology, <sup>2</sup>Rush University Medical Center, <sup>3</sup>Technische Universität Wien

**SESSION T08-S13**

14:40 – 16:00 • OCEANIA V

**Session Chair(s):** Wuge Briscoe**15:00 - T08-S13.2**

ID: 4EKC

Oral presentation

**The Potential of Solid Lubricants as Friction and Wear Modifiers in Restorative Materials for Dentistry**

Magdalena Rodziewicz-Weremczuk<sup>1</sup>, Vera Guduric<sup>2</sup>, Agnieszka Magrys<sup>3</sup>, Richard Frank Richter<sup>2</sup>, Anne Bernhardt<sup>2</sup>, Renata Chalas<sup>3</sup>, Michael Gelinsky<sup>2</sup>, Krzysztof Jan Kurzydowski<sup>1</sup>, Magdalena Lepicka<sup>1</sup>; <sup>1</sup>Bialystok University of Technology, <sup>2</sup>Dresden University of Technology, <sup>3</sup>Medical University of Lublin

**15:20 - T08-S13.3**

ID: 4EKQ

Oral presentation

**Limits of Friction-Based Assessment in Dental Cleaning Systems**

Pavel Cipek<sup>1</sup>, Martin Vrbka<sup>1</sup>; <sup>1</sup>Brno University of Technology

**15:40 - T08-S13.4**

ID: 4EKR

Oral presentation

**Applying Tribology to Cosmetic Products: Exploring the Relationship Between Formulation and Friction**

Dr. Kieran Nar<sup>1</sup>, Dr. Rory McAllister<sup>1</sup>; <sup>1</sup>PCS Instruments Ltd

**SESSION T08-S14**

16:40 – 17:40 • OCEANIA V

**Session Chair(s):** Xiangjun Zhang**16:40 - T08-S14.1**

ID: 4EKY

Oral presentation

**Acoustic Emission Associated with Stick–Slip in Human Skin–Surface Contact**

Andrei CALIN<sup>1</sup>, Andrei TUDOR<sup>1</sup>; <sup>1</sup>National University of Science and Technology POLITEHNICA Bucharest

**17:00 - T08-S14.2**

ID: 4END

Oral presentation

**Laser-induced nanospikes on the tribological and antibacterial properties of titanium and bioceramics**

Pranciškus Bakutis<sup>1,2</sup>, Tadas Matijošius<sup>3</sup>, Mindaugas Gedvilas<sup>3</sup>, Andrius Žemaitis<sup>3</sup>, Lina Ragelienė<sup>1</sup>, Dominika Adamovic<sup>1</sup>, Alfredas Smailys<sup>4</sup>, Serhii Lavrys<sup>1</sup>, Juozas Padgurskas<sup>1</sup>; <sup>1</sup>Vytautas Magnus University, <sup>2</sup>Kaunas Clinics, <sup>3</sup>Center for Physical Sciences and Technology, <sup>4</sup>Lithuanian University of Health Sciences

**17:20 - T08-S14.3**

ID: 4EMZ

Oral presentation

**Tribological behavior of micro-arc oxidation coatings containing Ag nanoparticles produced on titanium substrate**

Łukasz Maj<sup>1</sup>, Daniel Toboła<sup>2</sup>, Faiz Muhaffel<sup>3</sup>, Anna Trelka-Druzic<sup>1</sup>, Grzegorz Cempura<sup>4</sup>, Łukasz Boroń<sup>2</sup>, Mariusz Kulczyk<sup>5</sup>, Cezary Drenda<sup>6</sup>; <sup>1</sup>Institute of Metallurgy and Materials Science, Polish Academy of Sciences, <sup>2</sup>Łukasiewicz Research Network – Krakow Institute of Technology, <sup>3</sup>Istanbul Technical University, <sup>4</sup>AGH University of Krakow, <sup>5</sup>Institute of High Pressure Physics, Polish Academy of Sciences, <sup>6</sup>AGH University of Science & Technology

**Friday, September 25**

**SESSION P06**

08:30 – 09:30 • EUROPA III-IV

**Session Chair(s):** Roberto Martins de Souza**08:30 - P06.1**

ID: 4DTR

Plenary Speaker

**Lessons from Nature: Bioinspired Mechanically Durable and Self-healing Superliquiphilic/phobic Surfaces for Green Tribology**Bharat Bhushan<sup>1</sup>; <sup>1</sup>Ohio State University**SESSION T08-S15**

09:45 – 10:50 • OCEANIA V

**Session Chair(s):** Bharat Bhushan**09:45 - T08-S15.1**

ID: 4FCQ

Invited Speaker

**Invited Talk - Prof. Jason Stokes from The University of Queensland**Jason Stokes<sup>1</sup>; <sup>1</sup>University of Queensland**10:10 - T08-S15.2**

ID: 4ENP

Oral presentation

**Improvements to oral tribology test methodologies for xerostomia aid optimisation**Eleanor Barrett<sup>1</sup>; <sup>1</sup>Imperial College London**10:30 - T08-S15.3**

ID: 4ENR

Oral presentation

**Engineering Fluid–Porous Interface Affinity for Reversible Infiltration and Release in Biomimetic Tribological Contacts**Maria Giulia Sardiello<sup>1,2,3</sup>; <sup>1</sup>Istituto Italiano di Tecnologia, <sup>2</sup>Freudenberg Technology Innovation SE & Co. KG, <sup>3</sup>University of Salento**SESSION T08-S16**

11:30 – 12:30 • OCEANIA V

**Session Chair(s):** Klara Feile**11:30 - T08-S16.1**

ID: 4EQV

Oral presentation

**Commissioning of a Rheometer-Based Ball-on-Three-Plates Configuration for Pre-Clinical Friction Testing of Cartilage**Luca Tortoreto<sup>1</sup>, Dominik Jonas Federl<sup>2</sup>, Markus Wimmer<sup>1</sup>, Mohammed Abualia<sup>1</sup>; <sup>1</sup>Rush University Medical Center, <sup>2</sup>Austrian Institute of Technology**11:50 - T08-S16.2**

ID: 4ESA

Oral presentation

**MORPHING SURFACE TOPOGRAPHY AS PLATFORM FOR CULTURE CELLULAR BIOCONTACTS**Giulia Marie Claire Sanzia<sup>1,2</sup>, Luciana Algieri<sup>2</sup>, Virgilio Brunetti<sup>1</sup>, Massimo De Vittorio<sup>3,1</sup>, Michele Scaraggi<sup>1,2</sup>; <sup>1</sup>Istituto Italiano di Tecnologia, <sup>2</sup>University of Salento, <sup>3</sup>Technical University of Denmark / Danmarks Tekniske Universitet

**12:10 - T08-S16.3**

ID: 4EVB

Oral presentation

**Advanced Preclinical Simulation – Physiological Adverse Activities on Metal-on-Polymer THR and Ceramic-on-Ceramic Hip Resurfacing**Samuel Perry<sup>1</sup>, Ben Clegg<sup>2</sup>, Charles Joe Cullum<sup>3</sup>, Danielle De Villiers<sup>3</sup>, Michael Bryant<sup>1</sup>, Andrew Robert Beadling<sup>1</sup>;<sup>1</sup>University of Birmingham, <sup>2</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>3</sup>MatOrtho Ltd**SESSION T08-S17**

14:20 – 16:00 • OCEANIA V

**Session Chair(s):** Jason Stokes**14:20 - T08-S17.1**

ID: 4EWH

Oral presentation

**Tactile friction under boundary lubrication: Effect of bulk concentration of surfactants on fingertip friction**Suyash Gairola<sup>1</sup>, Sanjeev Kumar Gupta<sup>1</sup>, Musuvathi Santhapariipoornam Bobji<sup>1</sup>; <sup>1</sup>Indian Institute of Science, Bengaluru**15:00 - T08-S17.3**

ID: 4EXF

Oral presentation

**A new route to assess soil abrasiveness and wear mechanisms for materials in tillage tools**Urban Wiklund<sup>1</sup>, Maria Wojtowicz<sup>1</sup>, Andreas Brännström<sup>2</sup>, Esteban Guerrero<sup>2</sup>, Juan Carlos Nieves<sup>2</sup>; <sup>1</sup>Uppsala University / Uppsala Universitet, <sup>2</sup>Umea University / Umeå universitet**15:40 - T08-S17.5**

ID: 4F2W

Oral presentation

**Use of Pectin and Carrageenan as Low-Concentration Natural Polysaccharide Aqueous Lubricants**Aaron Anthony Ainsworth<sup>1</sup>, Iestyn Michael Nicholas Stead<sup>1</sup>, Karl Dearn<sup>1</sup>; <sup>1</sup>University of Birmingham**POSTER PRESENTATIONS****Thursday, September 24****SESSION Poster 06**

16:00 – 16:40 • America

**06.1 ID: 4EV6 - The Effect of Simulated Gait on the Micromotion and Corrosion of Modular Tapers**Andrew Robert Beadling<sup>1</sup>, Abigail Wade<sup>2</sup>, Charles Joe Cullum<sup>3</sup>, Simon Collins<sup>3</sup>, Danielle De Villiers<sup>3</sup>, Michael Bryant<sup>1</sup>; <sup>1</sup>University of Birmingham, <sup>2</sup>University of Leeds, <sup>3</sup>MatOrtho Ltd**06.2 ID: 4EPT - Wear behavior of low elastic modulus Ti–Nb–Si alloys under simulated physiological conditions**Derek Manoel Luup Carvalho<sup>1</sup>, Claudio Aguilar Ramirez<sup>2</sup>, Guilherme Oliveira Neves<sup>3</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina, <sup>2</sup>Universidad Técnica Federico Santa María, <sup>3</sup>Universidad del BíoBío**06.3 ID: 4EAJ - Influence of graphene oxide content on the coefficient of friction of a dental resin composite under reciprocating sliding**Henrique Miguel Cunha<sup>1</sup>, Victor Hugo Werner Baggio<sup>1</sup>, Ágatha Borges Teixeira Cunha<sup>2</sup>, Giuseppe Pintaude<sup>1</sup>, CARLOS HENRIQUE DA SILVA<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná, <sup>2</sup>Instituto Federal de Educação, Ciência e Tecnologia do Paraná



**06.4 ID: 4EEE - Rheological and Soft Tribological Characterization of an Oat-Based Functional Food Enriched with Curcumin-Loaded Solid Lipid Nanoparticles**

Guilherme Alves Favalessa<sup>1</sup>, Jorge Miguel Magalhães Vieira<sup>2</sup>, José Manuel Ramos Gomes<sup>2</sup>, Cristiano Simões de Abreu<sup>2</sup>, Cherlio Scandian<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo, <sup>2</sup>Universidade do Minho

**06.5 ID: 4DQ2 - Bioinspired Micropatterned Scaffolds Fabricated via Two-Photon Polymerization for Retinal Cell Behavior Control**

Nafiseh Forghani<sup>1</sup>, Michele Tricarico<sup>1</sup>, Leonetti Riccardo<sup>1</sup>, Ines Angelini<sup>2</sup>, Tavangari Zahed<sup>2</sup>, Matteo Battaglini<sup>3</sup>, Gianni Ciofani<sup>3</sup>, Giada Graziana Genchi<sup>2</sup>, Antonio Papangelo<sup>1</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Università degli Studi di Bari Aldo Moro, <sup>3</sup>Istituto Italiano di Tecnologia

**06.6 ID: 4EEB - A review on tribological aspects of PEEK coatings for orthopaedic implants**

Miguel Grissai Santos<sup>1</sup>, Giuseppe Pintaude<sup>1</sup>, Marjorie Benegra<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná

**06.7 ID: 4DZK - Evaluation of Bladeless Fan with Wavy Ledge Design for Noise Reduction and Efficiency**

Mohd Danial Ibrahim<sup>1</sup>, Ir. Sitti Aishah Najamudin<sup>1</sup>, Herbert Ian B Juhan<sup>2</sup>, Muhammad Alzam Amrun @ Ajis<sup>1</sup>, Abang Mohammad Nizam Abang Kamaruddin<sup>1</sup>, Ahmad Beng Hong Kueh<sup>1</sup>, Norlida Jamil<sup>1</sup>, Ahmad Adzhar bin Mohd Khairulzaim<sup>1</sup>, M Azlan B Masod<sup>3</sup>; <sup>1</sup>Universiti Malaysia Sarawak, <sup>2</sup>Project Programme Matters Sdn Bhd, <sup>3</sup>Petronas Research Sdn Bhd

**06.8 ID: 4EVS - Surface and Tribological Characteristics of TiN, CrN and ZrN Coatings on AISI 316L Stainless Steel for Medical Applications**

Monika Madej<sup>1</sup>, Magdalena Niemczewska-Wójcik<sup>2</sup>, Marcin Madej<sup>3</sup>; <sup>1</sup>Kielce University of Technology, <sup>2</sup>Cracow University of Technology, <sup>3</sup>Medical University of Lublin

**06.9 ID: 4DP4 - Challenges of materials selection and lubrication for hip prosthetic implants**

Sujeet Kumar Sinha<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Delhi

**06.10 ID: 4EXB - Properties of flowable composite materials used for dental fillings**

Katarzyna Piotrowska<sup>1</sup>, Monika Madej<sup>1</sup>, Joanna Wysokińska-Miszczyk<sup>2</sup>, Michał Paulo<sup>2</sup>, Szymon Drabik<sup>1</sup>; <sup>1</sup>Kielce University of Technology, <sup>2</sup>Medical University of Lublin

**06.11 ID: 4FBN - Epithelial Mechanics | Actin Reorganization Under Shear**

W. Gregory Sawyer<sup>1</sup>; <sup>1</sup>Moffitt Cancer Center

**06.12 ID: 4DMJ -  $\mu$ Syn - Functional Mucin Mimetics through Shear Labile Interaction Polymers (SLIPs)**

W. Gregory Sawyer<sup>1</sup>; <sup>1</sup>Moffitt Cancer Center

**06.13 ID: 4DXG - Novel biomimetic synthetic injectable macromolecular materials for efficient lubrication treatment of osteoarthritis**

Xiaoduo Zhao<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

## TRACK 09

### Tribo-Induced Surface and Sub-Surface Transformations

## ORAL PRESENTATIONS

Wednesday, September 23

### SESSION T09-S01

14:40 – 16:00 • OCEANIA-VIII

**Session Chair(s):** Hong Liang

#### 14:40 - T09-S01.1

ID: 4DM6

Oral presentation

#### Thermal Damage on Rolling/Sliding Contact Surfaces as Produced by Embedded Particles

Guillermo E. Morales-Espejel<sup>1</sup>; <sup>1</sup>SKF Research and Technology Development

#### 15:00 - T09-S01.2

ID: 4DMY

Oral presentation

#### Tribological Behaviour of PEEK Composites Reinforced with Alumina Particles: Influence of Particle Size and Content

Karl Delbé<sup>1</sup>, Marie Doumeng<sup>1</sup>, Olivier Marsan<sup>2</sup>, Florentin Berthet<sup>3</sup>, Jean Denape<sup>1</sup>, France Chabert<sup>1</sup>; <sup>1</sup>Université de Technologie de Tarbes, <sup>2</sup>CIRIMAT (UMR 5085), <sup>3</sup>Institut Clément Ader

#### 15:20 - T09-S01.3

ID: 4DTQ

Oral presentation

#### Residual Stress and Topography Effects on Rolling Contact Fatigue Behavior

Gilberto Martins de Oliveira Gomes<sup>1</sup>, Ronnie Rodrigo Rego<sup>1</sup>, Lucas Neves<sup>1</sup>, Naiane Stefani de Souza<sup>1</sup>, Giovanni Franco Ribeiro<sup>1</sup>, André Santana<sup>2</sup>; <sup>1</sup>Instituto Tecnológico de Aeronáutica, <sup>2</sup>AGCO Corporation

#### 15:40 - T09-S01.4

ID: 4EM6

Oral presentation

#### Highly conductive and wear resistant ceramic-liquid metal composite

Jianxun Zhao<sup>1</sup>, Aisheng Song<sup>1</sup>, Xin Li<sup>2</sup>, Tianbao Ma<sup>1</sup>; <sup>1</sup>Tsinghua University, <sup>2</sup>Beijing Institute of Technology

### SESSION T09-S02

16:40 – 17:40 • OCEANIA-VIII

**Session Chair(s):** Guillermo E. Morales-Espejel

#### 16:40 - T09-S02.1

ID: 4DRB

Oral presentation

#### Mechanism of the Shear-Induced Formation of Metastable Copper Sulfide Tribofilms

Wilfred T Tysoe<sup>1</sup>; <sup>1</sup>University of Wisconsin-Milwaukee

**17:00 - T09-S02.2**

ID: 4DPF

Oral presentation

**Prognosis of Wiping Damage in Plain Bearings**Markus Gilges<sup>1</sup>, Georg Jacobs<sup>1</sup>, Michelle Düsterbeck<sup>1</sup>, Daniil Tsigenov<sup>1</sup>, Benjamin Lehmann<sup>1</sup>, Math Lucassen<sup>1</sup>;<sup>1</sup>RWTH Aachen University**17:20 - T09-S02.3**

ID: 4DPZ

Oral presentation

**Forecasting Friction Behavior Despite Repeatability Challenges**Yulong Li<sup>1</sup>, Peter Gumbsch<sup>1,2</sup>, Christian Greiner<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology, <sup>2</sup>Fraunhofer Institute for Mechanics of Materials**Thursday, September 24****SESSION T09-S03**

09:30 – 10:50 • OCEANIA-VIII

**Session Chair(s):** Mihai Arghir**09:40 - T09-S03.1**

ID: 4FCR

Invited Speaker

**Velocity-weakening of rock friction: a thermally-driven interplay between roughness and third body**Guilhem Mollon<sup>1</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon**10:10 - T09-S03.2**

ID: 4DTZ

Oral presentation

**Triboelectro-Degradation Mechanisms in Metallic Contacts**Mohsen Tajedini<sup>1</sup>, Hong Liang<sup>1</sup>; <sup>1</sup>Texas A&M University**10:30 - T09-S03.3**

ID: 4DVP

Oral presentation

**Influence of TiC Reinforcement Content on the Wear Mechanisms of SPS Processed Inconel 718 Composites**pierre gorez<sup>1</sup>, Foad Naimi<sup>2</sup>, Eric FEULVARCH<sup>1</sup>, Vincent FRIDRICI<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>Sintermat**SESSION T09-S04**

11:30 – 12:30 • OCEANIA-VIII

**Session Chair(s):** María Cristina Moré Farias**11:30 - T09-S04.1**

ID: 4DX2

Oral presentation

**Consideration of surface degradation in powder-lubricated interfaces**Mihai ARGHIR<sup>1</sup>, Ibrahim DIALLO<sup>1</sup>, Mohamed ANDASMAS<sup>2</sup>, Lassad AMAMI<sup>3</sup>; <sup>1</sup>Institut Pprime, <sup>2</sup>Safran Aircraft Engines, <sup>3</sup>Centre Technique des Industries Mécaniques**11:50 - T09-S04.2**

ID: 4E2J

Oral presentation

**Quantitative evolution of tribo-layers in copper based friction materials for high-speed trains operating at 400 km/h equivalent energy density: Ratio of formation to damage**Yuxuan Xu<sup>1</sup>; <sup>1</sup>Central South University (Zhongnan University)**12:10 - T09-S04.3**

ID: 4ENS

Oral presentation

**Construction of heavy-load superlubricity based on the nanoclustering and ordering orientation of the tribo-products**Wenli Deng<sup>1</sup>, Xinchun Chen<sup>1</sup>, Han Tian<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University

**SESSION T09-S05**

14:40 – 16:00 • OCEANIA-VIII

**Session Chair(s):** Descartes**14:40 - T09-S05.1**

ID: 4E4W

Oral presentation

**Analysis of Wear Mechanisms and Microstructural Modifications of Grease-Lubricated Thrust Ball Bearings under False Brinelling**Roderick Jacques<sup>1</sup>; <sup>1</sup>Centre Technique des Industries Mécaniques**15:00 - T09-S05.2**

ID: 4E6S

Oral presentation

**Wear resistance of boron-activated 316L steel: Comparing elemental Ti and TiB<sub>2</sub> additions**Natacha Simoni Bagnara<sup>1</sup>, Greice Andrea Adamatti de Sá<sup>2</sup>, María Cristina Moré Farias<sup>2</sup>; <sup>1</sup>Universidade de Caxias do Sul, <sup>2</sup>University of Caxias do Sul**15:20 - T09-S05.3**

ID: 4EBE

Oral presentation

**The amorphization route of sp<sup>2</sup> carbon during incremental load dry sliding tests**Nicolás Ignacio Araya Rivera<sup>1</sup>, Guilherme Oliveira Neves<sup>2</sup>, José Daniel Biasoli Mello<sup>3</sup>, Claudio Aguilar Ramirez<sup>4</sup>, Cristiano Binder<sup>5</sup>, Aloisio Nelmo Klein<sup>5</sup>; <sup>1</sup>Universidad de Concepción, <sup>2</sup>Universidad del Biobio, <sup>3</sup>Universidade Federal de Uberlândia, <sup>4</sup>Universidad Técnica Federico Santa María, <sup>5</sup>Universidade Federal de Santa Catarina**15:40 - T09-S05.4**

ID: 4EBM

Oral presentation

**A Molecular Dynamics Study on Friction Induced Melting**Yihan Wang<sup>1</sup>, Bingxue Cheng<sup>1</sup>, Tianmin Shao<sup>1</sup>; <sup>1</sup>Tsinghua University**SESSION T09-S06**

16:40 – 17:40 • OCEANIA-VIII

**Session Chair(s):** Peter Gumbsch**16:40 - T09-S06.1**

ID: 4EED

Oral presentation

**Dopant-Controlled Stabilization of ta-C under Current-Carrying Sliding**Amirmasoud Khodadadibehtash<sup>1</sup>, Ji-Woong Jang<sup>2</sup>, Jongkuk Kim<sup>2</sup>, Ahmet T. Alpas<sup>1</sup>; <sup>1</sup>University of Windsor, <sup>2</sup>Korea Institute of Materials Science**17:00 - T09-S06.2**

ID: 4EHQ

Oral presentation

**Electrical Surface Damage Characteristics of Rolling Contacts Under Different Lubrication Regimes**Daniel Powers<sup>1</sup>, Ling Wang<sup>1</sup>, Suleiman Sharkh<sup>1</sup>; <sup>1</sup>University of Southampton**17:20 - T09-S06.3**

ID: 4EHY

Oral presentation

**Layer Thickness-Dependent Deformation and Damage Transitions in DLC/WC Multinanolayer Coatings**Ramin Aghababaei<sup>1</sup>, Li Ma<sup>1</sup>, Narguess Nemati<sup>1</sup>; <sup>1</sup>Aarhus University / Aarhus Universitet**Friday, September 25**

**SESSION T09-S07**

09:30 – 10:50 • OCEANIA-VIII

**Session Chair(s):** Descartes**09:30 - T09-S07.1**

ID: 4EXG

Oral presentation

**The Role of Hydrogen in Rolling Contact Fatigue of Bearing Steels**Kinza Jamil<sup>1</sup>, Finn Giuliani<sup>1</sup>, Rihard Pasaribu<sup>2</sup>, Amir Kadic<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Shell Global, The Hague**09:50 - T09-S07.2**

ID: 4F2Z

Oral presentation

**Influence of diffused hydrogen on cavitation-erosion resistance and damage mechanisms of 316L stainless steel**Stefanie Hanke<sup>1</sup>, Morteza Abedini<sup>1</sup>; <sup>1</sup>Universität Duisburg Essen**10:10 - T09-S07.3**

ID: 4F4T

Oral presentation

**High-temperature (300 °C) Sliding Wear Behavior of Nanostructured High-Strength Steel: Effect of Heat Treatment Mode**VASYL IEFREMENKO<sup>1</sup>, Yuliia Chabak<sup>1</sup>, Ivan Petrišinec<sup>1</sup>, Mikhailo Brykov<sup>2</sup>; <sup>1</sup>Institute of Materials Research, Slovak Academy of Science, <sup>2</sup>Technische Universität Berlin**10:30 - T09-S07.4**

ID: 4FBG

Oral presentation

**Exceptional high-temperature wear resistance in CoCrFeMnNi high-entropy alloy composite via Al/Ti doping and hBN/TiC dual ceramic reinforcement**Wenbo Ma<sup>1</sup>, Oleksandr Tisov<sup>2</sup>; <sup>1</sup>Xi'an jiaotong University, <sup>2</sup>Xi'an Jiaotong University**SESSION T09-S08**

11:30 – 12:30 • OCEANIA-VIII

**Session Chair(s):** Stefanie Hanke**11:30 - T09-S08.1**

ID: 4EXT

Oral presentation

**Electrically Tunable Behavior of Nb-Doped MoS<sub>2</sub> Coatings**Miguel Rubira Danelon<sup>1</sup>, Newton Kiyoshi Fukumasu<sup>1</sup>, Roberto Martins de Souza<sup>1</sup>, Ahmet T. Alpas<sup>2</sup>, ANDRÉ PAULO TSCHIPTSCHIN<sup>1</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>University of Windsor**11:50 - T09-S08.2**

ID: 4EZN

Oral presentation

**Effect of Ti<sub>2</sub>SnC on properties of iron-based hybrid self-lubricating composites**Javier Sánchez Jerez<sup>1</sup>, Christopher Salvo<sup>1</sup>, Cristiano Binder<sup>2</sup>, Diego Berti Salvaro<sup>2</sup>, Guilherme Oliveira Neves<sup>1</sup>; <sup>1</sup>Universidad del Biobio, <sup>2</sup>Universidade Federal de Santa Catarina**POSTER PRESENTATIONS****Thursday, September 24**

**SESSION Poster 05**

10:50 – 11:30 • America

**05.16 ID: 4DVJ - Modeling the tribocorrosion phenomenon of additively manufactured materials**Arkadiusz Stachowiak<sup>1</sup>, Dariusz Ulbrich<sup>1</sup>, Daniel Wieczorek<sup>1</sup>, Dariusz Bartkowski<sup>1</sup>, Aneta Bartkowska<sup>1</sup>; <sup>1</sup>Poznan University of Technology**05.17 ID: 4EWP - Low-velocity impact resistance of brittle nanoporous alumina layers**Gautam Revankar A<sup>1</sup>, Musuvathi Santhapariipoornam Bobji<sup>1</sup>; <sup>1</sup>Indian Institute of Science, Bengaluru**05.18 ID: 4DZD - Effect of Lubricant Inerting on Micropitting Formation with PAO**James Morley<sup>1</sup>, Suresh K Chettri<sup>1</sup>; <sup>1</sup>Phoenix Tribology**05.19 ID: 4EHT - A Study on the Characteristics of Tribology in Type 304 Stainless Steel**JEONGWON HUR<sup>1</sup>, Dogyun Byeon<sup>1</sup>, Sungmin Yoon<sup>1</sup>; <sup>1</sup>Changwon National University**05.20 ID: 4DSM - Tailoring Tribological Performance through LPBF-Induced Porous Microstructures**Jonas Franke<sup>1</sup>, Christian Greiner<sup>1</sup>; <sup>1</sup>Karlsruhe Institute of Technology**05.21 ID: 4DVB - Mechanistic Insights into Friction Layer Formation During Burnish: A Multi-Modal Approach Using UMT TriboLab and Nanoindentation**Sai Krishna Kancharla<sup>1</sup>, Laxminarayana, Radhika<sup>1</sup>, Mohamadou Diew<sup>1</sup>; <sup>1</sup>Bruker**05.22 ID: 4ESJ - Determining the critical length scale related to wear in rubber materials**Ryota Ushioda<sup>1</sup>, Marc Masen<sup>1</sup>; <sup>1</sup>Imperial College London**05.23 ID: 4EW2 - Tribological Analysis of W-Ag Electrical Contacts Produced by High-Energy Milling for the Oil and Gas Sector**Yaskara Montefusco Mota<sup>1</sup>, Salete Martins Alves<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Norte**05.24 ID: 4DQ4 - Influence of nitrogen doping to tribological response of MoS2 coating in humid environments: an in-situ Raman study**Yue Wang<sup>1</sup>, Taowen Xue<sup>2</sup>, Mengzhou Liao<sup>2</sup>, Tomas Polcar<sup>1,3</sup>; <sup>1</sup>Czech Technical University, <sup>2</sup>Sichuan University, <sup>3</sup>University of Southampton**TRACK 10****Multiscale Approaches for Multiphysics Modelling and In Situ Experiments in Tribology****ORAL PRESENTATIONS****Monday, September 21**

**SESSION T10-S01**

14:40 – 16:00 • OCEANIA VI

**Session Chair(s):** Ramin Aghababaei**14:50 - T10-S01.1**

ID: 4E6F

Keynote Speaker

**Multiscale Contact Mechanics with Applications**Bo Persson<sup>1,2</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, <sup>2</sup>Forschungszentrum Jülich**15:20 - T10-S01.2**

ID: 4DMS

Oral presentation

**Assessment of Electrically Induced Bearing Damage in EV Powertrains**Manjunath Manjunath<sup>1</sup>, Dieter Fauconnier<sup>1,2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Flanders Make**15:40 - T10-S01.3**

ID: 4DNZ

Oral presentation

**Prognosis of Thermal Critical Conditions of Planetary Plain Bearings in Wind Turbine Gearboxes**Benjamin Lehmann<sup>1</sup>, Anuj Khare<sup>1</sup>, Math Lucassen<sup>1</sup>, Georg Jacobs<sup>1</sup>; <sup>1</sup>RWTH Aachen University**SESSION T10-S02**

16:40 – 17:40 • OCEANIA VI

**Session Chair(s):** Bo Persson**16:40 - T10-S02.1**

ID: 4DPH

Oral presentation

**Stochastic process model of elastoplastic rough surface contact with scale-dependent hardness**Yang Xu<sup>1</sup>, Hengxu Song<sup>2</sup>, Jianqiao Hu<sup>2</sup>; <sup>1</sup>Hefei University of Technology, <sup>2</sup>LNM, Institute of Mechanics, Chinese Academy of Sciences**17:00 - T10-S02.2**

ID: 4DQE

Oral presentation

**In-situ Observation of High-Temperature Polymer Transfer Films**Shouyi Yin<sup>1</sup>, Ambrose Taylor<sup>1</sup>, Janet S. S. Wong<sup>1</sup>; <sup>1</sup>Imperial College London**17:20 - T10-S02.3**

ID: 4DRJ

Oral presentation

**A multiscale approach for the contact and gas flow rate through flat circular large contact**Mihai ARGHIR<sup>1</sup>, Julian LE ROUZIC<sup>1</sup>, Oumaima NAKIRI<sup>1</sup>; <sup>1</sup>Université de Poitiers**Tuesday, September 22****SESSION T10-S03**

09:30 – 10:50 • OCEANIA VI

**Session Chair(s):** Nicola Menga**09:40 - T10-S03.1**

ID: 4DR4

Invited Speaker

**Modelling of friction in wet grinding processes**Paul Thunich<sup>1</sup>, Michael Müller<sup>1</sup>; <sup>1</sup>Technische Universität Braunschweig

**10:10 - T10-S03.2**

ID: 4DT4

Oral presentation

**From Parametric Asperity Model to Local Micropitting Risk Map for Gears**

MARZOUG Abdellah<sup>1</sup>, Thibaut Chaise<sup>2</sup>, Ida Raoult<sup>3</sup>, William Ye<sup>4</sup>, Arnaud Duval<sup>2</sup>, Daniel Nelias<sup>2</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>3</sup>Safran Tech, <sup>4</sup>Safran Transmission Systems

**10:30 - T10-S03.3**

ID: 4DTC

Oral presentation

**MD simulations of rough contacts: Aqueous vs. oil-based lubrication**

Shubham Agarwal<sup>1</sup>, Martin H. Müser<sup>1</sup>; <sup>1</sup>Universität des Saarlandes

**SESSION T10-S04**

11:30 – 12:30 • OCEANIA VI

**Session Chair(s):** Michael Müller**11:30 - T10-S04.1**

ID: 4DTY

Oral presentation

**Surface tension and wettability effects in EHL contacts**

Abdelhadi FAKKAR<sup>1</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon

**11:50 - T10-S04.2**

ID: 4EQH

Oral presentation

**Experimental Parameter Study on Starved Lubricated Macroscopic Contacts**

Kassandra Kampen<sup>1</sup>, Michael Müller<sup>1</sup>; <sup>1</sup>Technische Universität Braunschweig

**12:10 - T10-S04.3**

ID: 4DXJ

Oral presentation

**How fluid is distributed in a friction gap during mixed lubrication**

Timo Fräger<sup>1</sup>, Kassandra Kampen<sup>1</sup>, Michael Müller<sup>1</sup>; <sup>1</sup>Technische Universität Braunschweig

**SESSION T10-S05**

14:40 – 16:00 • OCEANIA VI

**Session Chair(s):** Lars Pastewka**14:50 - T10-S05.1**

ID: 4E6T

Invited Speaker

**Multiscale In Situ Investigations and Multiphysics Models of Aqueous Gel Interfaces**

Angela A. Pitenis<sup>1</sup>; <sup>1</sup>University of California Santa Barbara

**15:20 - T10-S05.2**

ID: 4DXX

Oral presentation

**Synchrotron In-situ Investigation of Multi-scale Polymer Tribological Response**

Almoataz Algazzar<sup>1</sup>, Marko Bek<sup>2</sup>, Roland Kádár<sup>2</sup>, Kim Nygård<sup>3</sup>, Ann Terry<sup>3</sup>, Nazanin Emami<sup>1</sup>; <sup>1</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>2</sup>Chalmers University of Technology, <sup>3</sup>Lund University / Lunds universitet

**15:40 - T10-S05.3**

ID: 4DYG

Oral presentation

**3D adhesive contact mechanics: A variational energy-based approach**

Michele Santeramo<sup>1</sup>, Carmine Putignano<sup>1</sup>, Stefan Krenn<sup>2</sup>, Giuseppe Carbone<sup>3,1</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>3</sup>Nanjing University of Science & Technology

**SESSION T10-S06**

16:40 – 17:40 • OCEANIA VI



**Session Chair(s):** Angela A. Pitenis

**16:40 - T10-S06.1**

ID: 4DZ6

Oral presentation

**A Multiscale Transient Framework for Mixed Lubrication Modelling in Total Hip Replacement Bearings**

Robin Furze<sup>1</sup>, Peter K. Jimack<sup>1</sup>, Michael Bryant<sup>2</sup>, Lin Wang<sup>3</sup>, Mazen Al-Hajjar<sup>3</sup>, Gregory de Boer<sup>1</sup>; <sup>1</sup>University of Leeds, <sup>2</sup>University of Birmingham, <sup>3</sup>DePuy Synthes Joint Reconstruction

**17:00 - T10-S06.2**

ID: 4E2N

Oral presentation

**How Does Ammonia Alter Lubricant Performance: An Experimental and Molecular Dynamics Study on Microstructural Evolution and Viscosity Changes**

Yuxuan Sheng<sup>1</sup>, Xing Xu<sup>1</sup>, Xuan Ma<sup>1</sup>; <sup>1</sup>Harbin Engineering University

**17:20 - T10-S06.3**

ID: 4E4Y

Oral presentation

**Influence of roughness frequency cut-off in simulations of lubrication of rough surfaces**

Noel Brunetiere<sup>1</sup>, Arthur Francisco<sup>1</sup>; <sup>1</sup>Institut Pprime

## Wednesday, September 23

### SESSION T10 - S07

09:30 – 10:50 • OCEANIA VI

**Session Chair(s):** Carmine Putignano

**09:40 - T10 - S07.1**

ID: 4FAS

Keynote Speaker

**Multifield Contact-Lubrication Theories, Applications, and Modeling Approaches**

Q. Jane Wang<sup>1</sup>, Xiaoman Wang<sup>1</sup>, Brian Delaney<sup>1</sup>; <sup>1</sup>Northwestern University

**10:10 - T10 - S07.2**

ID: 4E6E

Oral presentation

**How sliding creates universal self-affine fractal surfaces**

Ruibin XU<sup>1,2</sup>, Haohao Ren<sup>1</sup>, Guilhem Mollon<sup>3</sup>, Wenbo Sheng<sup>1</sup>, Feng Zhou<sup>1</sup>, Bo Persson<sup>1,2</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, <sup>2</sup>Forschungszentrum Jülich, <sup>3</sup>Institut national des Science Appliquées de Lyon

**10:30 - T10 - S07.3**

ID: 4EN4

Oral presentation

**Homogenized Response of a Periodically Heterogeneous Elastic Half-Space**

Zichen Li<sup>1</sup>, Lucas Frérot<sup>1</sup>; <sup>1</sup>Sorbonne University

### SESSION T10 - S08

11:30 – 12:30 • OCEANIA VI

**Session Chair(s):** Q. Jane Wang

**11:30 - T10 - S08.1**

ID: 4EBW

Oral presentation

**Decoding Phosphate Tribofilm Behavior via Multiscale Characterization for Improved EV Performance**

Quentin ARNOUX<sup>1</sup>, Sophie Loehlé<sup>1</sup>, Hakim El Bahi<sup>1</sup>, Maria Clelia Righi<sup>2</sup>; <sup>1</sup>TotalEnergies, <sup>2</sup>Università di Bologna

**11:50 - T10 - S08.2**

ID: 4ECM

Oral presentation

**On Modeling Welding Polymer Process: A Molecular Dynamics Approach**

DIOP Mame Bousso<sup>1</sup>, SOLAR Mathieu<sup>1</sup>, BENZERARA Olivier<sup>1</sup>, FAVIER Damien<sup>1</sup>, EGELE Antoine<sup>1</sup>, MEYER, Hendrik<sup>1</sup>, GAUTHIER, Christian<sup>1</sup>; <sup>1</sup>Université de Strasbourg

**12:10 - T10 - S08.3**

ID: 4DSY

Oral presentation

**Truncation effects in the roller-end on flange contact**

Patrigeon Tristan<sup>1</sup>, NICOLAS FILLOT<sup>1</sup>, David Philippon<sup>1</sup>, Guillermo E. Morales-Espejel<sup>2</sup>; <sup>1</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>2</sup>SKF Research and Technology Development

**SESSION PJA03**

14:00 – 14:40 • EUROPA III-IV

**Session Chair(s):** Hong Liang**14:00 - PJA03.1**

ID: 4FCN

Peter Jost Award

**The mechanics of contact between rough surfaces**

Lars Pastewka<sup>1</sup>; <sup>1</sup>Universität Freiburg

**SESSION T10 - S09**

14:40 – 16:00 • OCEANIA VI

**Session Chair(s):** Andreas Almqvist**14:40 - T10 - S09.1**

ID: 4E6H

Oral presentation

**Constructing the continuum-physics core of a digital twin for tribological contacts under boundary and mixed lubrication conditions**

Michael Moseler<sup>1</sup>; <sup>1</sup>Fraunhofer Institute for Mechanics of Materials

**15:00 - T10 - S09.2**

ID: 4E6Z

Oral presentation

**Very high cycle fatigue of high strength steels applied to aeronautic rolling bearings**

Hugo Behl<sup>1</sup>, Daniel Nelias<sup>2</sup>, Naim Naouar<sup>2</sup>, Jean Baptiste Coudert<sup>3</sup>, Arnaud Ruellan<sup>3</sup>, Geoffray Deterre<sup>4</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>3</sup>SKF Aerospace, <sup>4</sup>Safran Aircraft Engines

**15:20 - T10 - S09.3**

ID: 4EAQ

Oral presentation

**Maintaining Joint Lubrication: A FSI Coupled Model of Cartilage Mechanics**

Arshad Kalathil Ashik<sup>1</sup>, Carmine Putignano<sup>2</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Politecnico di Bari

**15:40 - T10 - S09.4**

ID: 4EBH

Oral presentation

**Semi-analytical modeling of sprag clutches quasi-static behavior**

Tristan Dumet<sup>1</sup>, Sébastien Morterolle<sup>1</sup>, Daniel Nelias<sup>1</sup>; <sup>1</sup>Laboratoire de Mécanique des Contacts et des Structures

**SESSION T10 - S10**

16:40 – 17:40 • OCEANIA VI

**Session Chair(s):** Michael Moseler**16:40 - T10 - S10.1**

ID: 4EDQ

Oral presentation

**Fluid leakage in seals: An experimental and numerical analysis**

Carmine Putignano<sup>1</sup>, Michele Santeramo<sup>1</sup>, Stefan Krenn<sup>2</sup>, RAUSEO VALERIO EUPLIO<sup>1</sup>, Dario Scarati<sup>1</sup>, Giuseppe Carbone<sup>3</sup>, <sup>1</sup>Politecnico di Bari, <sup>2</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>3</sup>Nanjing University of Science & Technology

**17:00 - T10 - S10.2**

ID: 4EGD

Oral presentation

**Measurement-resolution bias in post-grinding rail RCF simulations**

Wiyao Edjeou<sup>1</sup>, Per Bergström<sup>1</sup>, Roland Larsson<sup>1</sup>, Per-Olof Larsson-Kräik<sup>1,2</sup>, Andreas Almqvist<sup>1</sup>; <sup>1</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>2</sup>Trafikverket

**17:20 - T10 - S10.3**

ID: 4F6B

Oral presentation

**Friction dynamics in the presence of a third body - Application to earthquakes**

Guilhem Mollon<sup>1</sup>, athalie Casas<sup>2</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Università degli Studi di Roma La Sapienza

**Thursday, September 24****SESSION T10 - S11**

09:30 – 10:50 • OCEANIA VI

**Session Chair(s):** Ruibin XU**09:40 - T10 - S11.1**

ID: 4FCW

Invited Speaker

**Adhesion of metallic nanoparticles: Direct measurements using in situ TEM**

Tevis Jacobs<sup>1</sup>; <sup>1</sup>University of Pittsburgh

**10:10 - T10 - S11.2**

ID: 4EJ2

Oral presentation

**Memory erasure in rough viscoelastic contact**

Zichen Li<sup>1</sup>, Renald Brenner<sup>1</sup>, Lucas Frérot<sup>1</sup>; <sup>1</sup>Sorbonne University

**10:30 - T10 - S11.3**

ID: 4EJB

Oral presentation

**Experimental Validation of the Heterogeneous Multiscale Methods for Modelling Laser Surface Textured Interfaces**

Joshua Montgomery<sup>1</sup>, Robin Furze<sup>1</sup>, Josh Armitage<sup>1</sup>, Camille Hammersley<sup>1</sup>, Mark C.T. Wilson<sup>1</sup>, Michael Bryant<sup>2</sup>, Gregory de Boer<sup>1</sup>; <sup>1</sup>University of Leeds, <sup>2</sup>University of Birmingham

**SESSION T10-S12**

11:30 – 12:30 • OCEANIA VI

**Session Chair(s):** Tevis Jacobs**11:30 - T10-S12.1**

ID: 4EKK

Oral presentation

**Thin Film-Forming Mechanisms of Aqueous Lubricant in Elastohydrodynamic Lubrication**Denis MAZUYER<sup>1</sup>; <sup>1</sup>École Centrale de Lyon**11:50 - T10-S12.2**

ID: 4ENF

Oral presentation

**The best from each scale: a methodological framework for coupling dry third body models and contact mechanics**Kévin Daigne<sup>1</sup>, Guilhem Mollon<sup>2</sup>, Arnaud Duval<sup>3</sup>, Thibaut Chaise<sup>3</sup>, Gergely Molnar<sup>2</sup>, David Dureisseix<sup>2</sup>, Anthony Gravouil<sup>2</sup>; <sup>1</sup>École Nationale d'Ingénieurs de Saint Etienne, <sup>2</sup>Institut national des Science Appliquées de Lyon, <sup>3</sup>Laboratoire de Mécanique des Contacts et des Structures**12:10 - T10-S12.3**

ID: 4F66

Oral presentation

**Topography Evolution Across Grain Boundaries During Directional Scratching of Crystalline Metals**Ramin Aghababaei<sup>1</sup>, Jinxuan Zhu<sup>1</sup>; <sup>1</sup>Aarhus University / Aarhus Universitet**SESSION PJA04**

14:00 – 14:40 • EUROPA III-IV

**Session Chair(s):** Tianmin Shao**14:00 - PJA04.1**

ID: 4FCP

Peter Jost Award

**Understanding and controlling superlubricity of solids**Tianbao Ma<sup>1</sup>; <sup>1</sup>Tsinghua University**SESSION T10-S13**

14:40 – 16:00 • OCEANIA VI

**Session Chair(s):** Guilhem Mollon**14:40 - T10-S13.1**

ID: 4EP4

Oral presentation

**Finite deformations in frictional sliding: how does the contact area change?**Guido Violano<sup>1</sup>, Luciano Afferrante<sup>1</sup>, Michele Scaraggi<sup>2,3</sup>, Nicola Menga<sup>1</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Università del Salento (ex-Lecce), <sup>3</sup>Istituto Italiano di Tecnologia**15:00 - T10-S13.2**

ID: 4EPZ

Oral presentation

**A promising approach to investigate third body flows: HPT and X-ray tomography**Descartes<sup>1</sup>, Pereira Agudelo<sup>1</sup>, Lachambre<sup>1</sup>, Lionel LAFARGE<sup>1</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon**15:20 - T10-S13.3**

ID: 4DW6

Oral presentation

**Micro-Scale Investigation of Friction and Wear in Journal Bearing Materials under Starved Lubrication Conditions**Kiro Scholtes<sup>1</sup>, Michael Müller<sup>1</sup>; <sup>1</sup>Technische Universität Braunschweig

**15:40 - T10-S13.4**

ID: 4F6R

Oral presentation

**Programmable Torque Transmission Using Inflatable Interlocking Metainterfaces**

Nikolaos Rogkas<sup>1</sup>, Ioannis P. Iliopoulos<sup>2</sup>, Stephanos Mpapas<sup>2</sup>, Pavlos Zalimidis<sup>2</sup>, Vasilios Spitas<sup>1</sup>; <sup>1</sup>National Technical University of Athens, <sup>2</sup>School of Pedagogical and Technological Education

**SESSION T10-S14**

16:40 – 17:40 • OCEANIA VI

**Session Chair(s):** Martin H. Muser**16:40 - T10-S14.1**

ID: 4ER2

Oral presentation

**Design of Experiments Optimization NbC and Graphite in Sintered Ferrous Brake Pads**

André de Oliveira França<sup>1</sup>, Isadora Schramm Deschamps<sup>1</sup>, Tatiana Bendo<sup>1</sup>, Maurício Vitor Kozerski Giaretton<sup>1</sup>, Arthur Garcia Lima da Cruz<sup>1</sup>, Augusto Adami Vidal<sup>1</sup>, Aloisio Nelmo Klein<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**17:00 - T10-S14.2**

ID: 4ERA

Oral presentation

**Shear Orientation Observation of Grease Thickener Using Rheo-SALS and Its Modeling**

Hanul CHUN<sup>1</sup>, TOMOKO HIRAYAMA<sup>1</sup>, Wataru YAGI<sup>2</sup>; <sup>1</sup>Kyoto University, <sup>2</sup>Idemitsu NTG Co., Ltd.,

**Friday, September 25****SESSION T10-S15**

09:30 – 10:50 • OCEANIA VI

**Session Chair(s):** Vladislav A. Yastrebov**09:40 - T10-S15.1**

ID: 4EDA

Invited Speaker

**A unified thermo-mechanical framework for rolling-sliding rubber-ice friction**

Denis MAZUYER<sup>1</sup>; <sup>1</sup>École Centrale de Lyon

**10:10 - T10-S15.2**

ID: 4ETH

Oral presentation

**Impact of Carbon Fiber Surface Modification on Wear Mechanisms in CFRP Composites**

Arthur Santana de Mendonça<sup>1</sup>, José Daniel Biasoli Mello<sup>1,2</sup>, Guoxin Xie<sup>3</sup>; <sup>1</sup>Universidade Federal de Santa Catarina, <sup>2</sup>Universidade Federal de Uberlândia, <sup>3</sup>Tsinghua University

**10:30 - T10-S15.3**

ID: 4EWT

Oral presentation

**Transition Characteristics of Fluid/Mixed Friction Regimes on Cylinder Block/Valve Plate Interface of a Wide-Range Variable-Speed Axial Piston Pump**

Dingchong LYU<sup>1</sup>, Dingchong LYU<sup>1</sup>, Jian FU<sup>1</sup>, Shoujun ZHAO<sup>2</sup>; <sup>1</sup>Beihang University (Beijing University of Aeronautics and Astronautics), <sup>2</sup>Beijing Institute of Precision Mechatronics and Controls

**SESSION T10-S16**

11:30 – 12:30 • OCEANIA VI

**Session Chair(s):** Denis MAZUYER**11:30 - T10-S16.1**

ID: 4EYJ

Oral presentation

**Multiscale Entropy Coupling in Tribological Running-In: Surface Topography as a Mesoscale Entropy Reservoir**Boris Brodmann<sup>1</sup>, Matthias Eifler<sup>2</sup>; <sup>1</sup>OptoSurf GmbH, <sup>2</sup>IU International University of Applied Sciences**11:50 - T10-S16.2**

ID: 4EYV

Oral presentation

**A Multi-Scale Modelling of Metal-to-Metal Seals**Vladislav YASTREBOV<sup>1</sup>, Komi Martin AFANGBEDJI<sup>2</sup>; <sup>1</sup>CNRS, Mines Paris - PSL, <sup>2</sup>École Nationale Supérieure de Techniques Avancées**12:10 - T10-S16.3**

ID: 4EZJ

Oral presentation

**Experimental characterization of particle-shape and surface-dependent tribological properties in railway ballast via 3D scanning and DEM calibration**Eleir Mundim Bortoleto<sup>1</sup>, Erivaldo Santos Jales<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale**POSTER PRESENTATIONS****Thursday, September 24****SESSION Poster 06**

16:00 – 16:40 • America

**06.14 ID: 4EMQ - Friction-Induced Tribochemical Processes in Minimal Mixtures**Chengyuan Fang<sup>1</sup>, Frank Schiefer<sup>1</sup>, Christina Lehmann<sup>1</sup>, Günter Bräuer<sup>1</sup>, Georg-Peter Ostermeyer<sup>2</sup>, Carsten Schilde<sup>1</sup>; <sup>1</sup>Technische Universität Braunschweig, <sup>2</sup>Simulation of Dynamical Systems GmbH**06.15 ID: 4DRY - EHL simulation considering the elastic deformation of rough surfaces caused by hydrodynamic pressure**Christopher Platis<sup>1</sup>, Klara Feile<sup>1</sup>, Markus Polzer<sup>2,1</sup>, Benedict Rothhammer<sup>2</sup>, Sandro Wartzack<sup>1</sup>; <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, <sup>2</sup>Friedrich Alexander Universität Erlangen Nürnberg**06.16 ID: 4DPK - Simulation-Driven Insight into Wear Performance of Laser Powder Bed Fused 316L Stainless Steel**German Omar Barrionuevo<sup>1</sup>, Héctor Calvopiña<sup>2</sup>; <sup>1</sup>Universidad San Francisco de Quito, <sup>2</sup>Escuela Politécnica del Ejército Ecuador**06.17 ID: 4DZM - Air-lubricant thin film rotating flows: An image-based, homogenised interface modelling framework**Nikolaos Rogkas<sup>1</sup>, Dimitrios Patsouras<sup>1</sup>, Vasilios Spitas<sup>1</sup>; <sup>1</sup>National Technical University of Athens

**06.18** ID: 4F2F - Understanding wear behavior in metallic and composite materials

NOEL<sup>1</sup>, MAZERAN, Pierre-Emmanuel<sup>2</sup>, STANKOVIC<sup>3</sup>; <sup>1</sup>Université du Maine le Mans Laval, <sup>2</sup>Université de Technologie de Compiègne, <sup>3</sup>Universidad Técnica Federico Santa María

**06.19** ID: 4DSZ - Axial sealing in scroll expanders is studied using a pin-on-disc test bench. Measured leakage rates are compared to models coupling contact mechanics and gas flow. Results show good agreement and help identify the most suitable flow model.

TOURNIS Stéphane<sup>1</sup>, Noel Brunetiere<sup>2</sup>, Vincent LEMORT<sup>3</sup>, Hamid ZAIDI<sup>1</sup>; <sup>1</sup>Université de Poitiers, <sup>2</sup>Institut Pprime, <sup>3</sup>Université de Liège

**06.20** ID: 4FBX - Frictional Transition of Viscoelastic Solids near Wave-Speed Sliding

Wataru Iwashita<sup>1,2</sup>, Michio Otsuki<sup>3,1</sup>; <sup>1</sup>The University of Osaka, <sup>2</sup>National Institute of Advanced Industrial Science and Technology, <sup>3</sup>Shimane University

**06.21** ID: 4DN4 - Understanding the activation volume in mechanochemistry at frictional interface

Yang Wang<sup>1</sup>; <sup>1</sup>Southwest Jiaotong University

**06.22** ID: 4EVQ - General Optimization Method and Parameter Correlation Analysis of Herringbone-grooved Mechanical Face Seals Based on THD Lubrication Model

Yongfan Li<sup>1</sup>, Qiang Li<sup>2</sup>, Noel Brunetiere<sup>3</sup>, Baojie Ren<sup>2</sup>, Muming Hao<sup>2</sup>; <sup>1</sup>Qingdao Agricultural University, <sup>2</sup>China University of Petroleum (East China), <sup>3</sup>Institut Pprime

## TRACK 11

### Triboelectric Nanogenerators for Energy and Sensors

## ORAL PRESENTATIONS

Thursday, September 24

**SESSION T11 -S01**

14:40 – 16:00 • OCEANIA VII

Session Chair(s): Di Wei

**14:50 - T11 -S01.1** ID: 4DQC **Keynote Speaker****High-Efficiency Hybrid Nanogenerators for Self-Powered Marine Monitoring Systems**

Junyi Zhai<sup>1</sup>, Zhong Lin Wang<sup>1</sup>; <sup>1</sup>Beijing Institute of Nanoenergy and Nanosystems

**15:20 - T11-S01.2**

ID: 4E6B

Oral presentation

**Robust Solid-Liquid Triboelectric Nanogenerators: Mechanisms, Strategies and Applications**

Daoai Wang<sup>1</sup>, Ying Liu<sup>2</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences, <sup>2</sup>Ocean University of China

**15:40 - T11-S01.3**

ID: 4DVR

Oral presentation

**Impact of Process Parameters on the Performance of Triboelectric Nanogenerators in Lateral Sliding Mode**

Philipp Mattauch<sup>1</sup>, Annika Hilgert<sup>1</sup>, Christian Orgeldinger<sup>1</sup>, Stephan Tremmel<sup>1</sup>, Gerhard Fischerauer<sup>1</sup>; <sup>1</sup>University of Bayreuth

**SESSION T11-S02**

16:40 – 17:40 • OCEANIA VII

**Session Chair(s):** Daoai Wang**16:40 - T11-S02.1**

ID: 4DMW

Invited Speaker

**Triboelectricity-driven green catalysis via contact electrification**

Di Wei<sup>1</sup>; <sup>1</sup>Beijing Institute of Nanoenergy and Nanosystems

**17:10 - T11-S02.2**

ID: 4DYC

Oral presentation

**Mutual Effects of Interfacial Charge Transfer and Light in Solid-Liquid Contact**

Shicai Zhu<sup>1</sup>, Liran Ma<sup>1</sup>, Yu Tian<sup>1</sup>, Jianbin Luo<sup>1</sup>; <sup>1</sup>Tsinghua University

**17:30 - T11-S02.3**

ID: 4DZP

Oral presentation

**Time-dependent Behavior and Wear Resistance of DLC-coated Triboelectric Nanogenerators**

Annika Hilgert<sup>1</sup>, Philipp Mattauch<sup>1</sup>, Christian Orgeldinger<sup>1</sup>, Gerhard Fischerauer<sup>2</sup>, Stephan Tremmel<sup>1</sup>; <sup>1</sup>University of Bayreuth, <sup>2</sup>Universität Bayreuth

**Friday, September 25****SESSION T11-S03**

09:30 – 10:50 • OCEANIA VII

**Session Chair(s):** Chi Zhang**09:40 - T11-S03.1**

ID: 4FCZ

Invited Speaker

**Invited talk - Zhen Wen**

Zhen Wen<sup>1</sup>; <sup>1</sup>Soochow University

**10:10 - T11-S03.2**

ID: 4DNC

Oral presentation

**Triboelectric Self-Powered Sensing and Digital Twin Mapping for Train Wheelset Bearings**

WANG SONG<sup>1</sup>; <sup>1</sup>Tsinghua University China

**10:30 - T11-S03.3**

ID: 4EBR

Oral presentation

**PVDF-Fe<sub>3</sub>O<sub>4</sub> Composites for Triboelectric Nanogenerators**

Durga Prasad Pabba<sup>1</sup>, Fabian Andres Lagos Antiman<sup>1</sup>, Natarajan Gnanaseelan<sup>2</sup>, Max Marian<sup>3</sup>; <sup>1</sup>Universidad Tecnológica Metropolitana, <sup>2</sup>Pontificia Universidad Católica de Chile, <sup>3</sup>Leibniz University Hannover



**SESSION T11-S04**

11:30 – 12:30 • OCEANIA VII

**Session Chair(s):** Zhen Wen**11:50 - T11-S04.2**

ID: 4EFH

Oral presentation

**Decoupling the effects of normal and shear stresses on the triboelectrification of PTFE via in-situ tribometry**Jamal Umer<sup>1</sup>, Andrew Robert Beadling<sup>1</sup>, Josh Armitage<sup>2</sup>, Michael Bryant<sup>1</sup>; <sup>1</sup>University of Birmingham, <sup>2</sup>University of Leeds**12:10 - T11-S04.3**

ID: 4ETJ

Oral presentation

**Taking Charge off Droplets: Advancing the Droplet TENG**Oliver Prendergast<sup>1</sup>, Giulio Fatti<sup>1</sup>, Andrew Holmes<sup>1</sup>, Thomas Reddyhoff<sup>1</sup>; <sup>1</sup>Imperial College London**POSTER PRESENTATIONS****Thursday, September 24****SESSION Poster 05**

10:50 – 11:30 • America

**05.25**

ID: 4F2P

**- New Generation of Battery Charging using Triboelectric Nanogenerators**Natalia Vargas Perdomo<sup>1</sup>, Louis Cuccia<sup>1</sup>, Xia Li<sup>1</sup>; <sup>1</sup>Concordia University Montreal**05.26**

ID: 4DYS

**- MXene/PVDF-Composites for Triboelectric Nanogenerators**Natarajan Gnanaseelan<sup>1</sup>, Durga Prasad Pabba<sup>2</sup>, David E. Acuña-Ureta<sup>1</sup>, Gerhard Fischerauer<sup>3</sup>, Stephan Tremmel<sup>4</sup>, Max Marian<sup>5</sup>; <sup>1</sup>Pontificia Universidad Católica de Chile, <sup>2</sup>Universidad Tecnológica Metropolitana, <sup>3</sup>Universität Bayreuth, <sup>4</sup>University of Bayreuth, <sup>5</sup>Leibniz University Hannover**TRACK 12****Tribomechadynamics, Tribotests and Monitoring****ORAL PRESENTATIONS****Monday, September 21**

**SESSION T12-S01**

14:40 – 16:00 • OCEANIA I

**Session Chair(s):** Giuseppe Pintaude**14:50 - T12-S01.1**

ID: 4FCA

Keynote Speaker

**Bridging Lab and Factory: Practical Applications of Ultra High Vacuum Tribology**Esteban Broitman<sup>1</sup>; <sup>1</sup>Sentys Inc**15:20 - T12-S01.2**

ID: 4DNX

Oral presentation

**Ultra-low energy, temperature field measurement (TFM)-based early failure detection of plain bearings**Thao Baszenski<sup>1</sup>; <sup>1</sup>RWTH Aachen University**15:40 - T12-S01.3**

ID: 4DT2

Oral presentation

**Calorimetric analysis of cracking under fretting loading: endurance curve and cumulative damage method**Bruno BERTHEL<sup>1</sup>, Vincent FRIDRICI<sup>2</sup>; <sup>1</sup>École Centrale de Lyon, <sup>2</sup>Centrale Lyon**SESSION T12-S02**

16:40 – 18:00 • OCEANIA I

**Session Chair(s):** Amílcar Ramalho**16:40 - T12-S02.1**

ID: 4DYT

Invited Speaker

**Advancements in Triboacoustics and its Integration in Tribological Practices: A Case Study with the Triboacoustic Pin**Michele Schirru<sup>1</sup>, Markus Varga<sup>1</sup>, Fabio Tatzgern<sup>1</sup>; <sup>1</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH**17:05 - T12-S02.2**

ID: 4EXP

Oral presentation

**Investigations of lubricated parallel sliding contacts on a ring on disc tribometer**Gerhard Poll<sup>1</sup>, Tobias Skubacz<sup>2</sup>, Dilek Bulut<sup>3</sup>; <sup>1</sup>Leibniz University Hannover, <sup>2</sup>Ostbayerische Technische Hochschule Amberg-Weiden, <sup>3</sup>Advanced Research Center for Nanolithography**17:25 - T12-S02.3**

ID: 4EXY

Oral presentation

**Lab-scale testing and performance screening of gear oils**Patrick Beau<sup>1</sup>, Nora Kind<sup>2</sup>; <sup>1</sup>Beau Engineering Services, <sup>2</sup>German Aerospace Center**Tuesday, September 22****SESSION T12-S03**

09:30 – 10:50 • OCEANIA I

**Session Chair(s):** Giuseppe Pintaude**09:30 - T12-S03.1**

ID: 4DNE

Oral presentation

**From Mechanisms to Lifetime: New Insights into Grease Lubrication**Markus Grebe<sup>1</sup>, Andreas Keller<sup>1</sup>; <sup>1</sup>Technical University Mannheim

**09:50 - T12-S03.2**

ID: 4DRV

Oral presentation

**Oil performance loss in wet brakes and clutches**Johannes Wirkner<sup>1</sup>, Dr.-Ing. Mirjam Bäse<sup>2</sup>, Astrid Lebel<sup>3</sup>, Mag. Dr. Charlotte Besser<sup>3</sup>, Patrick Strobl<sup>1</sup>, Karsten Stahl<sup>1</sup>;<sup>1</sup>Technical University of Munich, Gear Research Center, <sup>2</sup>Magna Powertrain GmbH & Co. KG, <sup>3</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH**10:10 - T12-S03.3**

ID: 4ECH

Oral presentation

**Oil Level Effects on Kinematics and Hydraulic Losses in Spherical and Full-Complement Roller Bearings Under Low Load to Prevent Smearing**Kim Marius Brill<sup>1</sup>, Thomas Petrzik<sup>2</sup>, Oliver Koch<sup>1</sup>, Georg Jacobs<sup>2</sup>; <sup>1</sup>RPTU University Kaiserslautern-Landau, <sup>2</sup>RWTH Aachen University**10:30 - T12-S03.4**

ID: 4EZE

Oral presentation

**Frictional Instabilities in Elastomer Contacts**Thomas Reddyhoff<sup>1</sup>, Nicola Menga<sup>2</sup>, Noa Soic<sup>1</sup>, Giulio Fatti<sup>1</sup>, Kian Kun Yap<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>Politecnico di Bari**SESSION T12-S04**

11:30 – 12:30 • OCEANIA I

**Session Chair(s):** Marcelo Braga dos Santos**11:30 - T12-S04.1**

ID: 4DMF

Oral presentation

**Measurement of fundamental – basic Quantities in Piston Cylinder Assemblies: Techniques, Repeatability, Limitations and Benefits**POLYCHRONIOS DELLIS<sup>1</sup>; <sup>1</sup>National Technical University of Athens**11:50 - T12-S04.2**

ID: 4DMT

Oral presentation

**Friction Behavior of mTBM Disc Cutter Ring Under a Reciprocating Test**Giuseppe Pintaude<sup>1</sup>, Gabriela Reis Piazzetta<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná**12:10 - T12-S04.3**

ID: 4DSV

Oral presentation

**Characterization of Sealing Material Behavior Under Dry Sliding Conditions for a Rotary Compressor Prototype**Florian Ausserer<sup>1</sup>, Fevzi Kafexhiu<sup>2</sup>, Carsten Gachot<sup>1</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>fautech gmbh**SESSION T12-S05**

14:40 – 16:00 • OCEANIA I

**Session Chair(s):** Michele Schirru, Amílcar Ramalho**14:50 - T12-S05.1**

ID: 4F2E

Invited Speaker

**Fretting Wear of Oscillating Ball Bearing**Daniel Nelias<sup>1</sup>, Remy Duquesne<sup>1</sup>, Sébastien Morterolle<sup>1</sup>; <sup>1</sup>Laboratoire de Mécanique des Contacts et des Structures**15:20 - T12-S05.2**

ID: 4F2C

Oral presentation

**Tribological Investigations under Varying Pressure Atmosphere**Felix Zak<sup>1,2</sup>; <sup>1</sup>Technische Universität München, <sup>2</sup>Optimol Instruments Prüftechnik GmbH

**15:40 - T12-S05.3**

ID: 4F6T

Oral presentation

**Development of an Experimental Apparatus for Investigating Preload Loss in Bolted Joints under Cyclic Shear Loading**

Douglas da Silva Carvalho<sup>1,2</sup>, João Paulo de Jesus Vieira<sup>1,2</sup>, Miguel Angel Narvaez Ardila<sup>2</sup>, Dênis Soares de Freitas<sup>2</sup>, Bruno Sousa Carneiro da Cunha<sup>2</sup>, Regina Paula Garcia<sup>1,2</sup>, Leonardo Rosa Ribeiro da Silva<sup>1,2</sup>;

<sup>1</sup>Universidade Federal de Uberlândia, <sup>2</sup>Laboratório de Tecnologia em Atrito e Desgaste

**SESSION T12-S06**

16:40 – 18:00 • OCEANIA I

**Session Chair(s):** POLYCHRONIOS DELLIS**16:40 - T12-S06.1**

ID: 4DNT

Oral presentation

**The Spark and the Slide: Investigating Coupled Tribo-Electrical Phenomena in EV Drivetrains**

Damien Yiyuan Khoo<sup>1</sup>; <sup>1</sup>Bruker

**17:00 - T12-S06.2**

ID: 4DYK

Oral presentation

**Triboelectroscopy: A New Tool for Real-Time Friction–Current Correlation**

Demian Abreu<sup>1</sup>, Marcelo Braga dos Santos<sup>1</sup>, José Daniel Biasoli Mello<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia

**17:20 - T12-S06.3**

ID: 4EQD

Oral presentation

**Experimental Characterization of Adhesion and Electroadhesion in Soft Contacts with Simultaneous Contact Area Measurement**

Luigi Portaluri<sup>1</sup>, Marco Bruno<sup>1</sup>, Luciana Algieri<sup>1</sup>, Michele Scaraggi<sup>2,3</sup>; <sup>1</sup>University of Salento, <sup>2</sup>Università del Salento (ex-Lecce), <sup>3</sup>Istituto Italiano di Tecnologia

**17:40 - T12-S06.4**

ID: 4F2S

Oral presentation

**A Transient Electromagnetic Field Model for Non-Ferromagnetic Particles with Motion Effects: Mechanism Analysis and Experimental Validation**

Zhehan Zhao<sup>1</sup>, Bin Zhao<sup>1</sup>, Xiqun Lu<sup>1</sup>; <sup>1</sup>Harbin Engineering University

**Wednesday, September 23****SESSION T12-S07**

09:30 – 10:30 • OCEANIA I

**Session Chair(s):** Marcelo Braga dos Santos**09:30 - T12-S07.1**

ID: 4FCB

Invited Speaker

**Real-world tribology testing is all about the art of deception**

Peter Lee<sup>1</sup>; <sup>1</sup>Southwest Research Institute

**09:55 - T12-S07.2**

ID: 4DX4

Oral presentation

**Fretting Wear Analysis and Optimization Design of Rope Sheave Lifting Mechanism**

yaoshijie<sup>1</sup>, shidongyan<sup>1</sup>, huangrenjie<sup>1</sup>; <sup>1</sup>Harbin Engineering University

**10:15 - T12-S07.3**

ID: 4EJE

Oral presentation

**Complete Stribeck Curve Prediction by Applying Machine Learning to Acoustic Emission Data from a Lubricated Sliding Contact**Song Yang<sup>1</sup>, Robert Gutierrez<sup>1</sup>, Thomas Kirkby<sup>1</sup>, Hamed Bouassida<sup>2</sup>, Marc Hilbert<sup>2</sup>, Min Yu<sup>1</sup>, Thomas Reddyhoff<sup>1</sup>;<sup>1</sup>Imperial College London, <sup>2</sup>TOYOTA GAZOO Racing Europe GmbH**SESSION T12-S08**

11:30 – 12:30 • OCEANIA I

**Session Chair(s):** Marcelo Braga dos Santos**11:40 - T12-S08.1**

ID: 4EHR

Keynote Speaker

**Fretting wear prediction in aero-engine blades**DANIELE BOTTO<sup>1</sup>, Mario Lavella<sup>2</sup>; <sup>1</sup>Politecnico di Torino, <sup>2</sup>Università degli Studi di Bergamo**12:10 - T12-S08.2**

ID: 4EGH

Oral presentation

**The effect of fretting wear on the forced response of structures with contact interfaces: experimental versus numerical results**Stefano Zucca<sup>1</sup>, DANIELE BOTTO<sup>1</sup>, Lakshminarayana Reddy Tamatam<sup>1</sup>; <sup>1</sup>Politecnico di Torino**SESSION T12-S09**

14:40 – 16:00 • OCEANIA I

**Session Chair(s):** Stefano Zucca**14:50 - T12-S09.1**

ID: 4ENX

Invited Speaker

**COMBINED STRATEGIES FOR THE COMPUTATIONALLY TRACTABLE MATCHING OF TURBINE BLADES WITH DRY-FRICTION UNDERPLATFORM DAMPERS**Muzio Gola<sup>1</sup>, Chiara Gastaldi<sup>1</sup>; <sup>1</sup>Politecnico di Torino**15:20 - T12-S09.2**

ID: 4EEV

Oral presentation

**Interface dynamic evolution of solids under dry frictional contact and correlation with macroscopic tribological response**Matteo Cattai<sup>1</sup>, Francesco Massi<sup>1</sup>, Laurent Baillet<sup>2</sup>, Meziane Anissa<sup>3</sup>, Mathieu Renouf<sup>4</sup>, Alfredo Taboada<sup>4</sup>;<sup>1</sup>Università degli Studi di Roma La Sapienza, <sup>2</sup>Université Grenoble Alpes, <sup>3</sup>Université de Bordeaux, <sup>4</sup>Université de Montpellier**SESSION T12-S10**

16:40 – 18:00 • OCEANIA I

**Session Chair(s):** DANIELE BOTTO**16:40 - T12-S10.1**

ID: 4DNF

Oral presentation

**A multiscale dynamic analysis method for jointed structures: from surface topography to nonlinear dynamic response**Chao Xu<sup>1</sup>, Huiyi Yang<sup>1</sup>, DANIELE BOTTO<sup>2</sup>; <sup>1</sup>Northwestern Polytechnical University, <sup>2</sup>Politecnico di Torino

**17:00 - T12-S10.2**

ID: 4DSW

Oral presentation

**Simulation and Experimental Validation of Bearing Creep simulation considering change of COF**Loc Duc Le<sup>1</sup>, Denny Knabner<sup>1</sup>, Alexander Hasse<sup>1</sup>; <sup>1</sup>Technische Universität Chemnitz**17:20 - T12-S10.3**

ID: 4DWG

Oral presentation

**The influence of size and Poisson's ratio on the stiffness of quasi conformal spherical contacts**Alberto Betti<sup>1</sup>, Paola Forte<sup>1</sup>, Enrico Ciulli<sup>1</sup>; <sup>1</sup>Università di Pisa**17:40 - T12-S10.4**

ID: 4EXJ

Oral presentation

**Impact of blade root joints on the dynamics of intrinsically mistuned bladed disks**Umidjon Usmanov<sup>1</sup>, Christian Maria Firrone<sup>1</sup>, Giuseppe Battiato<sup>1</sup>; <sup>1</sup>Politecnico di Torino

## Thursday, September 24

### SESSION T12 -S11

09:30 – 10:30 • OCEANIA I

**Session Chair(s):** Giuseppe Pintaude**09:40 - T12 -S11.1**

ID: 4FC6

Keynote Speaker

**Turning the Tribo-system into a Tribo-Test**Steven Shaffer<sup>1</sup>; <sup>1</sup>Shaffer Tribology Consulting formerly Bruker Nanosurfaces and Battelle Memorial Institute**10:10 - T12 -S11.2**

ID: 4EZ2

Oral presentation

**Influence of the dynamic characteristics of the tribometer on the reliability of the results**Amílcar Ramalho<sup>1</sup>, Luis Vilhena<sup>1</sup>; <sup>1</sup>Universidade de Coimbra

### SESSION T12-S12

11:30 – 12:30 • OCEANIA I

**Session Chair(s):** Marcelo Braga dos Santos**11:30 - T12-S12.1**

ID: 4E2M

Oral presentation

**Towards Reproducible Tribology: High-Replication Experiments and Statistical Evaluation of Measurement Uncertainty and System Variability**Christian Orgeldinger<sup>1</sup>, Stephan Tremmel<sup>1</sup>; <sup>1</sup>University of Bayreuth**11:50 - T12-S12.2**

ID: 4EHB

Oral presentation

**Friction monitoring during vibration using solitary waves**Alfredo Fantetti<sup>1</sup>, Jean Myung Jung<sup>2</sup>, Kathryn H. Matlack<sup>2</sup>, Alexander F. Vakakis<sup>2</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Illinois Urbana Champaign**12:10 - T12-S12.3**

ID: 4DZY

Oral presentation

**Experimental study of friction-induced vibrations in sliding rough contacts**ASSEMIEN N'GUETTA MODESTE<sup>1</sup>, LE BOT ALAIN<sup>1</sup>; <sup>1</sup>Centrale Lyon

### SESSION T12-S13

14:40 – 16:00 • OCEANIA I

**Session Chair(s):** Marcelo Braga dos Santos

**14:40 - T12-S13.1**

ID: 4DQQ

Oral presentation

**Unraveling Vibroadhesion: How Test Parameters Influence Vibration- Modulated Adhesion**

Michele Tricarico<sup>1</sup>, Antonio Papangelo<sup>1</sup>, Aleligne Yohannes Shiferaw<sup>1</sup>; <sup>1</sup>Politecnico di Bari

**15:00 - T12-S13.2**

ID: 4DVZ

Oral presentation

**Effect of Material Pairing on Acoustic Emission Features During Dry Sliding**

Lars Friedrich<sup>1</sup>, Prof. Dr. sc. ETH Alexander Hasse<sup>1</sup>; <sup>1</sup>Technische Universität Chemnitz

**15:20 - T12-S13.3**

ID: 4EHA

Oral presentation

**High-speed optical imaging of dry metallic impacts for structural diagnostics**

Alfredo Fantetti<sup>1</sup>, Jaffry Jaman<sup>1</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London

**15:40 - T12-S13.4**

ID: 4DX6

Oral presentation

**Experimental evidence of dynamic stiction without static friction: Friction vector rotation creates intermittent slippage**

Ken Nakano<sup>1</sup>, Toshiki Watanabe<sup>1</sup>, Hikaru Okubo<sup>1</sup>, Valentin L. Popov<sup>2</sup>; <sup>1</sup>Yokohama National University, <sup>2</sup>Technische Universität Berlin

## SESSION T12-S14

16:40 – 18:00 • OCEANIA I

**Session Chair(s):** Amílcar Ramalho

**16:40 - T12-S14.1**

ID: 4DVK

Oral presentation

**Experimental determination of evolution of the coefficient of friction and implementation in a simulation routine**

Denny Knabner<sup>1</sup>, Prof. Dr. sc. ETH Alexander Hasse<sup>1</sup>; <sup>1</sup>Technische Universität Chemnitz

**17:00 - T12-S14.2**

ID: 4DVQ

Oral presentation

**Rotating tribometer at high temperature for understanding copper extrusion tool wear**

pierre gorez<sup>1</sup>, Gaëtan BOUVARD<sup>1</sup>, Foad Naimi<sup>2</sup>, Eric FEULVARCH<sup>1</sup>, Vincent FRIDRICI<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>Sintermat

**17:20 - T12-S14.3**

ID: 4EPP

Oral presentation

**Galling behaviour of AZ80 magnesium alloy and H13 steel by using an adapted four-ball tester**

Luis Ernesto Mozqueda-Flores<sup>1</sup>, Jose Victoria-Hernandez<sup>2</sup>, Ezequiel A. Gallardo-Hernández<sup>1</sup>, Manuel Vite-Torres<sup>1</sup>, Cesar Sedano de la Rosa<sup>3</sup>, JAVIER A. FRIAS-FLORES<sup>4</sup>; <sup>1</sup>Instituto Politecnico Nacional, <sup>2</sup>Researcher at Helmholtz-Zentrum Hereon, <sup>3</sup>Universidad de Guadalajara, <sup>4</sup>Instituto Politécnico Nacional

**17:40 - T12-S14.4**

ID: 4F4R

Oral presentation

**Low-Speed Lubrication Behaviour of Greases for Wind Turbine Main Shaft Bearings Assessed by EIS**

Manjunath Manjunath<sup>1,2,3</sup>, Dieter Fauconnier<sup>1,4</sup>, Balasubramaniam Vengudusamy<sup>3</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Dieter Fauconnier, <sup>3</sup>Balasubramaniam Vengudusamy, <sup>4</sup>Flanders Make

## POSTER PRESENTATIONS

## Wednesday, September 23

### SESSION Poster 04

16:00 – 16:40 • America

#### 04.16 ID: 4ES6 - Continuous Measurement of Cage Wear in Cylindrical Roller Bearings

Daisuke Suzuki<sup>1</sup>; <sup>1</sup>Railway Technical Research Institute

#### 04.17 ID: 4DXE - Micro-abrasive Wear in PTFE and PTFE Composites for Ball Valve Seats

Diógenes Barbosa Teles<sup>1</sup>, Régis Henrique da Silva Souza<sup>2</sup>, Patric Daniel Neis<sup>2</sup>, María Cristina Moré Farias<sup>1</sup>, Ney Francisco Ferreira<sup>2</sup>; <sup>1</sup>Universidade de Caxias do Sul, <sup>2</sup>Universidade Federal do Rio Grande do Sul

#### 04.18 ID: 4F4H - Ball cratering evaluation of epoxy and ECTFE coatings on carbon steel under abrasive conditions

Diógenes Barbosa Teles<sup>1</sup>, María Cristina Moré Farias<sup>2</sup>, Carlos Roberto Luna-Domínguez<sup>3</sup>, Jorge Humberto Luna-Domínguez<sup>3</sup>, Ronaldo Câmara Cozza<sup>4</sup>; <sup>1</sup>Universidade de Caxias do Sul, <sup>2</sup>University of Caxias do Sul, <sup>3</sup>Autonomous University of Tamaulipas, <sup>4</sup>Unidade de Ensino do Centro Estadual de Educação Tecnológica Paula Souza

#### 04.19 ID: 4DYF - Correlating Vibration Analysis to the Development of Gear Pitting

Djordy Van Maele<sup>1,2</sup>, Jean Carlos Poletto<sup>1,2</sup>, Dieter Fauconnier<sup>1,2</sup>, Patrick De Baets<sup>1,2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Flanders Make

#### 04.20 ID: 4ERN - Tribological Monitoring Using an LR Sensor Applied to the Detection of Metallic Particles in Pure Mineral Oil

Eduardo Moreira Bezerra<sup>1</sup>, Aparecido Carlos Gonçalves<sup>1</sup>; <sup>1</sup>Universidade Estadual Paulista

#### 04.21 ID: 4ESZ - The Method of Implementation of the Optical Fiber Sensor in Selected Sliding Contacts

Grzegorz Orlicki<sup>1</sup>, Jacek Łubiński<sup>1</sup>, Małgorzata Szczerska<sup>1</sup>; <sup>1</sup>Gdansk University of Technology / Politechnika Gdanska

#### 04.22 ID: 4DYN - Exploring the relationship between powder tribology and aerodynamic performance of DPI formulations

MICHELLE ALVARES SARCINELLI<sup>1</sup>, Lara Melo Campos<sup>1</sup>, Luany Gabrielle de Barros Ferreira<sup>1</sup>, Arthur da Silva Cravo<sup>2</sup>, Marcelo Henrique Cunha Chaves<sup>1</sup>, Francisco Alexandrino Júnior<sup>1</sup>, Beatriz Ferreira de Carvalho Patricio<sup>2</sup>, Helvécio Vinícius Antunes Rocha<sup>1</sup>; <sup>1</sup>Fundação Oswaldo Cruz, <sup>2</sup>Universidade Federal do Estado do Rio de Janeiro

#### 04.23 ID: 4E6M - Practical considerations for employing Vision Systems in Gear Monitoring

Jean Carlos Poletto<sup>1,2</sup>, Djordy Van Maele<sup>1,2</sup>, Dieter Fauconnier<sup>1,2</sup>, Patrick De Baets<sup>1,3,2</sup>; <sup>1</sup>Ghent University / Universiteit Gent, <sup>2</sup>Flanders Make, <sup>3</sup>Royal Institute of Technology / Kungliga Tekniska Högskolan

#### 04.24 ID: 4DVA - A simplified test protocol and data processing to investigate impact-sliding wear in PWR environment

Matteo Delli Colli<sup>1</sup>, Nabil Marouf<sup>1</sup>, Arnaud Dubois<sup>1</sup>, Carole Falcand<sup>1</sup>; <sup>1</sup>Framatome

#### 04.25 ID: 4F6H - Effect of lubricant viscosity on a boundary lubrication test

Rafael Nunes da Silva<sup>1</sup>, Alice do Amaral Rodrigues<sup>1</sup>, Régis Henrique da Silva Souza<sup>1</sup>, Carlos M.C.G. Fernandes<sup>2</sup>, Ney Francisco Ferreira<sup>1</sup>, Patric Daniel Neis<sup>1</sup>, Germano Lasch<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande do Sul, <sup>2</sup>Universidade do Porto



**04.26** (ID: 4FDT) - Investigating the Influence of Product Microstructure on the Mechanical and Tribological Interactions of Synthetic Skin

Tejal Shah<sup>1</sup>, Andrew Robert Beadling<sup>1</sup>, Evangelos Liamas<sup>2</sup>, Ophelie Torres<sup>2</sup>, Michael Bryant<sup>1</sup>; <sup>1</sup>University of Birmingham, <sup>2</sup>Unilever

**04.27** (ID: 4EBD) - Electrifying tribometry for lubricant developments used in electrified drive technologies

Tushar Khosla<sup>1</sup>, Krishnamurti Singh<sup>2</sup>, Mathias woydt<sup>3</sup>; <sup>1</sup>Rtec Instruments Inc., <sup>2</sup>Rtec-Instruments Inc., <sup>3</sup>MATRILUB

## TRACK 13

### AI-STLE - Artificial Intelligence for Smart Tribology and Lubrication Engineering

## ORAL PRESENTATIONS

Monday, September 21

### SESSION T13-S01

14:40 – 16:00 • OCEANIA III

Session Chair(s): Max Marian

**14:50 - T13-S01.1** (ID: 4FD2) (Keynote Speaker)

How AI Is Accelerating Materials Discovery and What Tribology Can Do Next

Taylor Sparks<sup>1</sup>; <sup>1</sup>University of Utah

**15:20 - T13-S01.2** (ID: 4DPC) (Oral presentation)

A Data-Driven Framework Using Bayesian Optimization and Surrogate Models for the Accelerated Multi-Objective Design of Tribological Components

César Pastor<sup>1</sup>, Maureen Kosiol<sup>2,1</sup>; <sup>1</sup>Robert Bosch GmbH, <sup>2</sup>Universität Stuttgart

**15:40 - T13-S01.3** (ID: 4DQH) (Oral presentation)

Physics-Informed Neural Network Framework for Static and Dynamic Performance Prediction of 3D Hydrodynamic Journal Bearings

ADESH KUMAR TOMAR<sup>1</sup>, Max Marian<sup>1,2</sup>; <sup>1</sup>Pontificia Universidad Católica de Chile, <sup>2</sup>Leibniz University Hannover

**SESSION T13-S02**

16:40 – 17:40 • OCEANIA III

**Session Chair(s):** Nick Garabedian**16:40 - T13-S02.1**

ID: 4DR2

Oral presentation

**A machine learning based approach for the estimation of the global energy losses of cylindrical roller bearings**

Felix Pfister<sup>1</sup>, Benedict Rothhammer<sup>2</sup>, Sandro Wartzack<sup>3</sup>; <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, Engineering Design, <sup>2</sup>Friedrich Alexander Universität Erlangen Nürnberg, <sup>3</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg

**17:00 - T13-S02.2**

ID: 4DR6

Oral presentation

**Machine-Learning Potentials for First-Principles Prediction of Tribochemical Reaction Rates**

Wilfred T Tysoe<sup>1</sup>, Paolo Restuccia<sup>2</sup>, Mauro Ferrario<sup>2</sup>, Maria Clelia Righi<sup>2</sup>; <sup>1</sup>University of Wisconsin-Milwaukee, <sup>2</sup>Università di Bologna

**17:20 - T13-S02.3**

ID: 4DRQ

Oral presentation

**Reproduction of Wear Mechanisms in Chute Lining Plates: A Tribological Study Supported by Machine Learning Classification**

Adrián Ricardo Cárdenas Flórez<sup>1,2</sup>, Letícia Dias Batista<sup>1,2</sup>, Cristian Camilo Viáfara Arango<sup>2</sup>, Jose Jimmy Penagos<sup>2</sup>, Andrea Gomes Campos<sup>1</sup>; <sup>1</sup>Universidade Federal de Ouro Preto, <sup>2</sup>Instituto Tecnológico Vale

**Tuesday, September 22****SESSION T13-S03**

09:30 – 10:50 • OCEANIA III

**Session Chair(s):** Wilfred T Tysoe**09:30 - T13-S03.1**

ID: 4DVN

Oral presentation

**Predicting DLC Coating Wear: Role of Material Descriptors in Deep Learning and Physics-Constrained Models**

Imène Lahouij<sup>1</sup>, Oussama Cherguy<sup>2</sup>, Radoslaw CHMIELOWSKI<sup>3</sup>, Elie Hachem<sup>2</sup>; <sup>1</sup>École des Mines de Paris, <sup>2</sup>MINES Paris, PSL University, Centre for material forming (CEMEF), <sup>3</sup>Imra Europe S.A.S

**09:50 - T13-S03.2**

ID: 4DVS

Oral presentation

**A Generalised Bearing Fault Diagnosis Model Based on Advanced Signal Processing Techniques and Multimodal Self-Supervised Learning**

Amirmasoud Kiakojouri<sup>1</sup>, Ling Wang<sup>1</sup>; <sup>1</sup>University of Southampton

**10:10 - T13-S03.3**

ID: 4DZW

Oral presentation

**Machine-learning-enabled interpretation of tribological deformation patterns in large-scale MD data**

Hendrik J Ehrich<sup>1,2</sup>, Marvin Carl May<sup>3</sup>, Carsten Gachot<sup>1</sup>, Stefan J Eder<sup>1,2</sup>; <sup>1</sup>Technische Universität Wien, <sup>2</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>3</sup>Nanyang Technological University

**10:30 - T13-S03.4**

ID: 4DT6

Oral presentation

**Multi-Scale Insight into Green Lubrication: Coupling ML-driven Molecular Dynamics and Experiments for Bio-derived Additives**

Sophie Loehlé<sup>1</sup>, Alberto Pacini<sup>2</sup>, Pedretti<sup>2</sup>, Pedro Martins Ferreira<sup>1</sup>, Quentin ARNOUX<sup>1</sup>, Hakim El Bahi<sup>1</sup>, Maria Clelia Righi<sup>2</sup>; <sup>1</sup>TotalEnergies, <sup>2</sup>Università di Bologna

**SESSION T13-S04**

11:30 – 12:30 • OCEANIA III

**Session Chair(s):** Prathima Nalam**11:30 - T13-S04.1**

ID: 4DYR

Oral presentation

**Wear Behavior Characterization through Deep Embedding Clustering**

Philipp Maximilian Sieberg<sup>1</sup>, Shuai Zhu<sup>1</sup>, Morteza Abedini<sup>1</sup>, Stefanie Hanke<sup>1</sup>; <sup>1</sup>Universität Duisburg Essen

**11:50 - T13-S04.2**

ID: 4E4C

Oral presentation

**Enabling AI in Tribology through FAIR Knowledge Graphs**

Nick Garabedian<sup>1</sup>, Iliia Tanev Bagov<sup>1</sup>; <sup>1</sup>datin GmbH

**12:10 - T13-S04.3**

ID: 4EPE

Oral presentation

**Digital Twins of Lubricated Systems and Their Evolution**

Filimonas Kaliafietis<sup>1</sup>, Daniele Dini<sup>1</sup>, Suhaib Ardah<sup>1</sup>, James P. Ewen<sup>2,1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Bath

**SESSION T13-S05**

14:40 – 16:00 • OCEANIA III

**Session Chair(s):** Max Marian**14:40 - T13-S05.1**

ID: 4EAA

Oral presentation

**i-TRIBOMAT: A Global Knowledge and Data Hub for Tribology**

Xavier Borras<sup>1</sup>, Amaya Igartua<sup>2</sup>, Franz Pirker<sup>3</sup>, Dirk Spaltmann<sup>4</sup>, Roland Larsson<sup>5</sup>, Ichiro Minami<sup>5</sup>, Helena Ronkainen<sup>6</sup>, Friedrich Franek<sup>3</sup>, Ivana Tóth<sup>3</sup>; <sup>1</sup>i-TRIBOMAT: The European Tribology Centre, <sup>2</sup>Fundación Tekniker, <sup>3</sup>Austrian Centre of Competence for Tribology - AC2T research GmbH, <sup>4</sup>Federal Institute for Material research and Testing, <sup>5</sup>Lulea University of Technology / Luleå tekniska universitet, <sup>6</sup>VTT

**15:00 - T13-S05.2**

ID: 4EDP

Oral presentation

**Tool Wear-Driven Tribological Evolution in Surface Milling of Aluminum using Explainable AI**

Ricardo Knoblauch<sup>1</sup>, Mohamed EL MANSORI<sup>1</sup>, Jinhan Gao<sup>1</sup>, Sourish Ghosh<sup>1</sup>, Cosimi Corleto<sup>2</sup>; <sup>1</sup>École Nationale Supérieure des Arts et Métiers, <sup>2</sup>Stil Marposs

**15:20 - T13-S05.3**

ID: 4Ezc

Oral presentation

**Data-Centric Investigation of Galling**

Arda Kupelioglu<sup>1</sup>; <sup>1</sup>University of Southampton

**SESSION T13-S06**

16:40 – 17:40 • OCEANIA III

**Session Chair(s):** Maria Clelia Righi**16:40 - T13-S06.1**

ID: 4EGG

Oral presentation

**A Predictive Framework for Friction and Wear of DLC Coatings Using Literature Data**

Imène Lahouij<sup>1</sup>, Oussama Cherguy<sup>2</sup>, Radoslaw CHMIELOWSKI<sup>3</sup>, Elie Hachem<sup>2</sup>; <sup>1</sup>École des Mines de Paris, <sup>2</sup>MINES Paris, PSL University, Centre for material forming (CEMEF), <sup>3</sup>Imra Europe S.A.S

**17:00 - T13-S06.2**

ID: 4EMG

Oral presentation

**Explainable Machine Learning for Predicting Galling in API Steels from Friction and Mechanical Data**

Juan Pablo Abdelnabe<sup>1,2</sup>, Germán Prieto<sup>1,2</sup>, Juan Tappatá<sup>1</sup>, Walter Roberto Tuckart<sup>1,2</sup>, Fernando Delbianco<sup>1,2</sup>; <sup>1</sup>Universidad Nacional del Sur, <sup>2</sup>Consejo Nacional de Investigaciones Científicas y Técnicas

**17:20 - T13-S06.3**

ID: 4ENK

Oral presentation

**Predictability and Explicability: an interpretable Deep-Learning model to predict friction from third body morphology**

Khalef Boulefrakh<sup>1</sup>, Guilhem Mollon<sup>1</sup>, Bouchot Alizée<sup>1,2</sup>, Descartes<sup>1</sup>, Yann Gavet<sup>3</sup>; <sup>1</sup>Institut national des Science Appliquées de Lyon, <sup>2</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>3</sup>Mines Saint Etienne, IMT

**Wednesday, September 23****SESSION T13-S07**

09:30 – 10:50 • OCEANIA III

**Session Chair(s):** Ilia Bagov**09:40 - T13-S07.1**

ID: 4FBA

Invited Speaker

**High-Throughput Testing & Machine Learning Based Discovery of Novel Alloys**

John F. Curry<sup>1</sup>, Tomas F. Babuska<sup>1</sup>, David Montes de Oca Zapiain<sup>1</sup>, Nathan K Brown<sup>1</sup>, N. Scott Bobbitt<sup>1</sup>, Michael Chandross<sup>1</sup>, Frank W. DelRio<sup>1</sup>, Kyle R. Dorman<sup>1</sup>, David P. Adams<sup>1</sup>, Camille Edwards<sup>1</sup>, Filippo Mangolini<sup>2</sup>; <sup>1</sup>Sandia National Laboratories, <sup>2</sup>University of Texas Austin

**10:10 - T13-S07.2**

ID: 4EQ6

Oral presentation

**Semantically Grounded AI for Tribological Creativity on Demand**

Nick Garabedian<sup>1</sup>, Ilia Tanev Bagov<sup>1</sup>; <sup>1</sup>datin GmbH

**10:30 - T13-S07.3**

ID: 4ERF

Oral presentation

**Machine Learning-Based Prediction of Tribological Behavior in In-Situ Reinforced NbC-Fe Metal Matrix Composites**

Eduardo Moraes Souza<sup>1</sup>, Aloisio Nelmo Klein<sup>1</sup>, Isadora Schramm Deschamps<sup>1</sup>, Isadora Hasselmann Machado<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

**SESSION T13-S08**

11:30 – 12:30 • OCEANIA III

**Session Chair(s):** Adesh Kumar Tomar, Max Marian**11:30 - T13-S08.1**

ID: 4ESB

Oral presentation

**Artificial Intelligence for Image-Based Monitoring and Prediction of Cutting Tool Coating Wear**Martin Dienwiebel<sup>1</sup>, Jan Wolf<sup>2</sup>, Nithin Kumar Bandaru<sup>3</sup>, Hans-Christian Möhring<sup>2</sup>; <sup>1</sup>Microtribology Centre, <sup>2</sup>Universität Stuttgart, <sup>3</sup>Karlsruhe Institute of Technology**12:10 - T13-S08.3**

ID: 4EYZ

Oral presentation

**Advancing solid interfaces and Lubricants by High Throughput and Machine Learning Calculations**Maria Clelia Righi<sup>1</sup>; <sup>1</sup>Università di Bologna**POSTER PRESENTATIONS****Thursday, September 24****SESSION Poster 06**

16:00 – 16:40 • America

**06.23 ID: 4E4Z - Use of neural networks for the prediction of viscosity in extreme pressure and shear rate operating conditions**Gabriel Santos<sup>1</sup>, Bouchot Alizée<sup>1</sup>, Laetitia Martinie<sup>1</sup>, Nathalie BOUSCHARAIN<sup>1</sup>, Guillermo E. Morales-Espejel<sup>2</sup>, NICOLAS FILLOT<sup>1</sup>; <sup>1</sup>Laboratoire de Mécanique des Contacts et des Structures, <sup>2</sup>SKF Research and Technology Development**06.24 ID: 4EHF - AI-driven prediction of scratch responses in carbide-reinforced martensitic steel**Izabel Fernanda Machado<sup>1</sup>, Vanessa Seriacopi<sup>2</sup>, Angel Biskupovic<sup>1</sup>, MODESTO VALCI MOREIRA LOPES<sup>1</sup>, Roberto Martins de Souza<sup>1</sup>; <sup>1</sup>Universidade de São Paulo, <sup>2</sup>Maua Institute of Technology**TRACK 14****Forum Young Tribologists****ORAL PRESENTATIONS****Sunday, September 20**

**SESSION T14-S01**

15:00 – 18:00 • OCEANIA IV

**Session Chair(s):** Nathan Fantecelle Strey**15:00 - T14-S01.1**

ID: 4FDQ

Young Tribologist Elevator Pitches

**From Tribology to Manufacturing: Tribochemistry-Enabled Fabrication of Functional Thin Films**yuyang.yuan<sup>1</sup>; <sup>1</sup>University of Leeds**15:05 - T14-S01.2**

ID: 4F6X

Young Tribologist Elevator Pitches

**Effect of Surface Texturing on Plasto Hydrodynamic Lubrication of Coated Forming Tools**Elton Yvens Godoy de Oliveira<sup>1</sup>; <sup>1</sup>Universidade Federal de Pelotas**15:10 - T14-S01.3**

ID: 4EKZ

Young Tribologist Elevator Pitches

**Development of a Computational and Experimental Framework for Tool Surface Texture Design in Sheet Metal Forming**Ainhoa Guinea<sup>1</sup>, Andrea Aginagalde<sup>1</sup>, Eneko Saenz de Argandoña<sup>1</sup>, Joseba Mendiguren<sup>1</sup>, Alaitz Zabala<sup>1</sup>;<sup>1</sup>Universidad de Mondragon Mondragon Unibertsitatea**15:15 - T14-S01.4**

ID: 4EGF

Young Tribologist Elevator Pitches

**Elasto-hydrodynamic Analysis of Non-Conformal Lubricated Contact**Luciana Nasca<sup>1</sup>, Carmine Putignano<sup>1</sup>, Elena Pierro<sup>1</sup>, Cecilia Malverti<sup>2</sup>, Davide Miazzi<sup>2</sup>, Andrea Ronchi<sup>2</sup>, Giuseppe Carbone<sup>3</sup>; <sup>1</sup>Politecnico di Bari, <sup>2</sup>Pirelli Tyre S.p.A, <sup>3</sup>Nanjing University of Science & Technology**15:20 - T14-S01.5**

ID: 4EMJ

Young Tribologist Elevator Pitches

**Multiscale surface engineering enhances multifunctionality in wet environments**Nikolaos Rogkas<sup>1</sup>; <sup>1</sup>National Technical University of Athens**15:30 - T14-S01.7**

ID: 4EK2

Young Tribologist Elevator Pitches

**Role of Nanoparticles on Liquid Superlubricity across Lubrication Regimes of Non-Conformal Contacts**Lukáš Daněk<sup>1</sup>, Petr Šperka<sup>1</sup>; <sup>1</sup>Brno University of Technology**15:35 - T14-S01.8**

ID: 4EYS

Young Tribologist Elevator Pitches

**Water-Lubricated Superlubricity of SiC/YAG-RHA Coatings Produced by SPS**Franciele Dias de Castro<sup>1</sup>, Henara Lillian Costa<sup>2</sup>, Nathan Fantecelle Strey<sup>3</sup>; <sup>1</sup>Universidade Federal de Pelotas, <sup>2</sup>Universidade Federal do Rio Grande, <sup>3</sup>Universidade Federal do Espírito Santo**15:40 - T14-S01.9**

ID: 4EYE

Young Tribologist Elevator Pitches

**From Friction Reduction to Friction Orchestration: Toward Sustainable Superlubricity**Paul-marie Zubieta-Laborde<sup>1</sup>, Graham L.W. Cross<sup>2</sup>, Frédéric Dubreuil<sup>1</sup>, Maria Isabel De Barros Bouchet<sup>1</sup>; <sup>1</sup>Centrale Lyon, <sup>2</sup>Trinity College University of Dublin**15:45 - T14-S01.10**

ID: 4FBC

Young Tribologist Elevator Pitches

**Design of Novel Space Environment-Adaptive Lubricating Films Inspired by In-Orbit Exposure Findings**Jun He<sup>1</sup>; <sup>1</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

**15:50 - T14-S01.11**

ID: 4FAX

Young Tribologist Elevator Pitches

**Modification of load capacity property on a lubricant grease railway system contaminated with water**Rodrigo Ruiz Ramirez<sup>1</sup>, José Antonio González Perez<sup>1</sup>, Benjamín M. Marín-Santibañez<sup>1</sup>; <sup>1</sup>Instituto Politécnico Nacional**15:55 - T14-S01.12**

ID: 4DTP

Young Tribologist Elevator Pitches

**Impact of water contamination on greases used in railway systems**José Antonio González Perez<sup>1</sup>, Manuel Vite-Torres<sup>1</sup>, Rodrigo Ruiz Ramirez<sup>1</sup>, Benjamín M. Marín-Santibañez<sup>1</sup>; <sup>1</sup>Instituto Politécnico Nacional**16:00 - T14-S01.13**

ID: 4EEH

Young Tribologist Elevator Pitches

**Exploring How Atomic-Scale Tribochemistry Establishes the Paradigm for Wafer-Scale Global Planarization of Advanced Integrated Circuits**Lifei Zhang<sup>1</sup>, Xinchun Lu<sup>1</sup>; <sup>1</sup>Tsinghua University**16:05 - T14-S01.14**

ID: 4EHD

Young Tribologist Elevator Pitches

**Tribochemistry of iron oxide and DBP interactions in electrified environments.**Lucio Roberto Menezes<sup>1</sup>, Marcelo Braga dos Santos<sup>1</sup>, José Daniel Biasoli Mello<sup>1</sup>; <sup>1</sup>Universidade Federal de Uberlândia**16:10 - T14-S01.15**

ID: 4EPJ

Young Tribologist Elevator Pitches

**Modeling in Tribology under Electrification**Zhaoran Zhu<sup>1</sup>, James P. Ewen<sup>2,1</sup>, Daniele Dini<sup>1</sup>; <sup>1</sup>Imperial College London, <sup>2</sup>University of Bath**16:15 - T14-S01.16**

ID: 4F46

Young Tribologist Elevator Pitches

**Geometrical properties of asperities on real contact area**Mark Kuzman<sup>1</sup>, Mitjan Kalin<sup>2</sup>; <sup>1</sup>Univerza v Ljubljani, <sup>2</sup>University of Ljubljana**16:25 - T14-S01.18**

ID: 4E2P

Young Tribologist Elevator Pitches

**Tribo-AID Kit: An Open-Hardware, Portable Tribometer for Education and Reproducible Testing**Christian Orgeldinger<sup>1</sup>, Gohs, Marco<sup>2,3</sup>, Gerhard, Jacqueline<sup>2,3</sup>, Ricardo Alves da Silva Crespo Martins<sup>4,2</sup>, Anton Kalimullin<sup>2,5</sup>; <sup>1</sup>University of Bayreuth, <sup>2</sup>Gesellschaft für Tribologie e.V., <sup>3</sup>University of Stuttgart, <sup>4</sup>Leibniz University Hannover, <sup>5</sup>Magna Powertrain**16:30 - T14-S01.19**

ID: 4EHJ

Young Tribologist Elevator Pitches

**Numerical approach of different tribological wear tests**João Vitor Raimundo Silva e Silva<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo**16:35 - T14-S01.20**

ID: 4EJM

Young Tribologist Elevator Pitches

**Tribology in hydrogen environments: development of experimental methodologies, analysis of mechanisms and evaluation of the influence of microstructure and surface**Aitor Ayerdi<sup>1</sup>, Andrea Aginagalde<sup>1</sup>, Wilson Tato<sup>1</sup>, Iñaki Hurtado<sup>1</sup>, Pablo Garcia-Michelena<sup>1</sup>, Alaitz Zabala<sup>1</sup>; <sup>1</sup>Universidad de Mondragon Mondragon Unibertsitatea**16:40 - T14-S01.21**

ID: 4EHM

Young Tribologist Elevator Pitches

**Slurry Erosive Wear of DLC (a-C) Coatings**Juliana Souza de Oliveira<sup>1</sup>; <sup>1</sup>Universidade Federal do Espírito Santo

16:45 - **T14-S01.22** ID: 4EY6 **Young Tribologist Elevator Pitches**

#### DLC Coatings for Erosion and Scaling Resistance

Rubson Mação Camporez<sup>1</sup>; <sup>1</sup>UNIVERSIDADE FEDERAL DO ESPÍRITO SANTO

16:50 - **T14-S01.23** ID: 4F4Y **Young Tribologist Elevator Pitches**

#### Wear and fretting resistance of gas nitride layers on 3D-printed titanium alloys

Serhii Lavrys<sup>1</sup>; <sup>1</sup>Vytautas Magnus University

16:55 - **T14-S01.24** ID: 4DSB **Young Tribologist Elevator Pitches**

#### Ultrahigh Thermally Conductive Ag-Coated Basalt Fibers with Hierarchical Nanostructured Interfaces for Improved Anti-Wear Properties of Self-Lubricating Fabric Composites

Chuang Zhu<sup>1</sup>; <sup>1</sup>Donghua University

17:00 - **T14-S01.25** ID: 4F4Z **Young Tribologist Elevator Pitches**

#### Plasma surface alloying: enhancing the tribological performance of automotive tooling materials through surface engineering

Tainá Pigosso<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

17:05 - **T14-S01.26** ID: 4EPM **Young Tribologist Elevator Pitches**

#### EVALUATION OF ZINC ADHESION ON CAST IRON TOOL MATERIALS

Pedro Paulo Búrigo Bastos<sup>1</sup>, Francisco Cavilha Neto<sup>1</sup>, Derek Manoel Luup Carvalho<sup>1</sup>, João Pedro Vaz Silveira<sup>1</sup>, Alicia Correa Lucena<sup>1</sup>, Diego Berti Salvaro<sup>1</sup>, Cristiano Binder<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

17:10 - **T14-S01.27** ID: 4FBJ **Young Tribologist Elevator Pitches**

#### Influence of Surface Pre-Treatment on the Adhesion of Patinas Formed on a New Weathering Steel

HADILLE EMANUELE GONCALVES MENDES<sup>1</sup>, Felipe Kevin Correia Luz<sup>1</sup>, Marlise Moreira<sup>1</sup>, José Henrique Alano<sup>1</sup>, Márcio L. A. Cunha<sup>2</sup>, Henara Lillian Costa<sup>1</sup>; <sup>1</sup>Universidade Federal do Rio Grande, <sup>2</sup>Arcelor Mittal Brasil

17:15 - **T14-S01.28** ID: 4EBZ **Young Tribologist Elevator Pitches**

#### Tribological Analysis of Drill Rig Jaws: A Proposal for Wear Mechanism Characterization

Kamila de Fatima Costa da Silva<sup>1</sup>, Cristian Camilo Viáfara Arango<sup>1</sup>, Gustavo Tressia<sup>1</sup>; <sup>1</sup>Instituto Tecnológico Vale

17:20 - **T14-S01.29** ID: 4EWS **Young Tribologist Elevator Pitches**

#### Reproduction of Wear Mechanisms in Chute Lining Plates: A Tribological Study Supported by Machine Learning Classification

Adrián Ricardo Cárdenas Flórez<sup>1,2</sup>; <sup>1</sup>Universidade Federal de Ouro Preto, <sup>2</sup>Instituto Tecnológico Vale

17:30 - **T14-S01.31** ID: 4EWK **Young Tribologist Elevator Pitches**

#### Polymer Based Composites for Tribology

Arthur Santana de Mendonça<sup>1</sup>; <sup>1</sup>Universidade Federal de Santa Catarina

17:35 - **T14-S01.32** ID: 4ETT **Young Tribologist Elevator Pitches**

#### Engineering Interfacial Adhesion of Thin Polymer Films with Nanoscale Heterogeneities

Chiranjit Majhi<sup>1</sup>, Krishnacharya Khare<sup>1</sup>; <sup>1</sup>Indian Institute of Technology Kanpur

17:40 - **T14-S01.33** ID: 4EBK **Young Tribologist Elevator Pitches**

#### Titanium, hydroxyapatite, and bioglass coatings for enhancing the PEEK orthopaedic implants performance

Miguel Grissai Santos<sup>1</sup>, Giuseppe Pintaude<sup>1</sup>, Marjorie Benegra<sup>1</sup>; <sup>1</sup>Universidade Tecnológica Federal do Paraná



**17:45 - T14-S01.34** ID: 4ETZ **Young Tribologist Elevator Pitches**

**What activities are beneficial for the knee joint?**

Arshad Kalathil Ashik<sup>1</sup>; <sup>1</sup>Imperial College London

**17:50 - T14-S01.35** ID: 4EXS **Young Tribologist Elevator Pitches**

**The Potential of Solid Lubricants as Friction and Wear Modifiers in Restorative Materials for Dentistry**

Magdalena Rodziewicz-Weremczuk<sup>1</sup>, Vera Guduric<sup>2</sup>, Agnieszka Magrys<sup>3</sup>, Richard Frank Richter<sup>2</sup>, Anne Bernhardt<sup>2</sup>, Renata Chalas<sup>3</sup>, Michael Gelinsky<sup>2</sup>, Krzysztof Jan Kurzydowski<sup>1</sup>, Magdalena Lepicka<sup>1</sup>; <sup>1</sup>Bialystok University of Technology, <sup>2</sup>Dresden University of Technology, <sup>3</sup>Medical University of Lublin

**17:55 - T14-S01.36** ID: 4FDR **Young Tribologist Elevator Pitches**

**Multiscale Numerical Approach for Subject-Specific Wear Prediction of Total Knee Replacements**

Klara Feile<sup>1</sup>; <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg

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