

42nd Leeds-Lyon Symposium on TRIBOLOGY

SURFACES AND INTERFACES:
MYSTERIES AT
DIFFERENT SCALES



SEPTEMBER 7-9, 2015
Valpré Lyon
France

• Programme at a glance

	Sunday 6 th September	Monday 7 th September
7:00		
8:00		Breakfast
9:00		Registration (start at 8:00)
		Welcome address
		9:40 Plenary - Invited speaker
10:00		10:20 Coffee break
11:00		10:40 T5-1 50 years 12:20 T3-1 In situ T4-1 Joint Tribology
12:00		Lunch + Group picture at 13:35
13:00		13:50 Plenary - Invited speaker
14:00		14:30 Break
15:00		14:40 T2-1 Tribo (hard): materials 16:00 T3-2 Mechanisms T4-2 Skin Tribology
16:00		Coffee break
17:00	On-site registration opening (until 20:00)	16:20 T2-2 Tribochemistry and wet lubrication 18:00 T3-3 Materials T5-2 Rough Elastomers
18:00		
19:00	Buffet	Buffet - Poster party (Room 4)
20:00		
21:00	Valpré will be open until midnight (only for room check in)	
22:00		

Tuesday 8 th September		Wednesday 9 th September	
Breakfast		Breakfast	
8:30 9:10	Plenary - Invited speaker	8:30 9:10	Plenary - Invited speaker
Coffee break		Coffee break	
9:20 10:40	T1-1 Lubricated rough contacts T5-3 Rough Contact 1 T3-4 Nano	9:20 10:40	T4-3 Teeth and Lipidic T1-4 Experimental techniques in lubrication T2-5 Techniques and macro devices
Coffee break		Coffee break	
11:00 12:20	T1-2 EHL modelling T5-4 Lubricated Rough Contacts II T3-5 Wear	11:00 12:20	T4-4 Tactile and Joint T1-5 Lubrication applications II T5-6 Rough Contact 2
Lunch		Lunch	
13:50 14:30	Plenary - Invited speaker	13:50 15:10	T3-8 Surface topography T1-6 Slipping surfaces
Break		Awards and closure	
14:40 16:00	T3-6 Coating T2-3 Damage, RCF and surfaces T1-3 Lubrication applications I		
Coffee break			
16:20 18:00	T3-7 Fretting T5-5 Adhesion and Cracks T2-4 Boundary regime in ICE		
Banquet			



Tribolo

Tribology

Welcome

to Valpré, venue for the
42nd Leeds Lyon
Symposium on Tribology
'Surfaces and Interfaces,
Mysteries at Different Scales'.

Multi-scale features in tribology are born from the need to take into account the many complex processes at work in a real system, especially at the interface of the solid bodies' surfaces. A succession of phenomena with different orders of magnitude in time and space must be identified and thus properly linked each other. The method may include both theoretical and empirical knowledge at widely differing scales.

Tribological phenomena at surfaces and interfaces are multi-scale by nature. They still reveal 'mysteries' which remain important scientific barriers to break. It is only natural that modeling techniques including time and space scales dependencies and/or experimental tools handling proper time and space dimensions can be fruitfully applied. Tribologists attending the 42nd Leeds Lyon Symposium on Tribology present their work in the various aspects of surfaces and interfaces, ranging from atomistic theories to practical engineering experiments. In doing so, the validity of the models and the relevance of the results can be better established in advanced studies of lubrication, friction and wear.

Of all the many abstracts received, 200 presentations (oral and poster) will be given, related to the following conference topics:

Track 1: Scale-related analysis of full-film lubrication

Track 2: Across the scales in the boundary lubrication regime

Track 3: Dry friction and wear: from mechanics to physical-chemistry

Track 4: Biological response in tribological environments

Track 5: Fifty years of Greenwood-Williamson

• Practical information

CONTACT

If you need assistance please speak to **Sophie De Oliveira, Anne-Marie Colin and Emmanuel Montero** (Leeds-Lyon Symposium Secretariat) who will be happy to assist you.

VENUE / DIRECTIONS

Valpré Lyon - BP 165, 1 chemin de Chalin, 69131 ECULLY Cedex
Tel : +33 4 72 18 05 05 - Fax : +33 4 72 18 05 99 - E-mail : reception@valpre.com
www.valpre.com

VALPRÉ ACCESS & DEPARTURE

- Free shuttles will be available after the Symposium closure on Wednesday afternoon (16:00)

- from Valpré to Part-Dieu railway station
- from Valpré to Saint Exupery Airport.

Reservation will be done on-site, on a first arrived first served basis.

- By car

Valpré is located at 3 minutes from the highway intersection Valvert (A6 to Paris/Marseille, Peripherique TEO to Geneva/Grenoble)

- Taxi to St Exupery Airport

This should take about 30-40 minutes and cost approximately 60 euros (80 euros after 19:00).

- Taxi to Part Dieu Train Station

This should take about 30 minutes and cost approximately 30 euros.

- Bus/Metro/Rhone Express

> **To the Part Dieu Train station (30-45 minutes):** *Take the bus n°19 (see access map) direction Hotel de Ville, stop Gorge de Loup. Then take Metro D direction Gare de vénisieux, stop Saxe Gambetta. Then take Metro B direction Charpenne, stop Part Dieu.*

otherwise:

Take the bus n°19 (see access map) direction "Hotel de Ville", stop "Hotel de Ville". Then take Metro A direction "Vaux-enVelin – La Soie", stop "Charpenne". Then take Metro B direction "Oullins", stop "Part Dieu".

> **To the St Exupery Airport:** follow the instructions to go to Part Dieu train station then take Rhone Express direction Airport (30 minutes).

REGISTRATION

Registration will take place at Valpré, on Sunday afternoon, September 6th, from 16:00 to 21:00. Registration will be open on Monday, September 7th, from 8:00.



TECHNICAL PROGRAMME

The opening and first technical session start on Monday at 9:20. Presentations will take place in Room 1 (Plenary Lectures) on the ground floor. It will be clearly signposted.

There may be some modifications to the Technical Programme. Please check the programme displayed at each session room.

Please turn off or silence your mobile phones during the sessions. **Taking pictures is not allowed during sessions.**

SYMPOSIUM BANQUET

The Symposium banquet will take place on Tuesday evening, September 8th, at the Cirque Imagine. Coaches to Cirque Imagine will leave Valpré at 18:30 prompt.

GROUP PICTURE

The group picture will be taken on Monday 7th at 13:35 prompt on the lawn.

SYMPOSIUM MEAL TIMES

Sunday 6 September

18:00 – 21:00 Buffet

Monday 7 September

07:30 – 8:30 Breakfast

12:20 – 13:30 Lunch (group picture at 13:35)

18:30 – 21:00 Buffet (in parallel with Poster Party)

Tuesday 8 September

07:30 – 08:30 Breakfast

12:20 – 13:50 Lunch

18:30 – 23:00 Symposium Dinner at the Cirque Imagine

Wednesday 9 September

07:30 – 08:30 Breakfast

12:20 – 13:50 Lunch

Tea, coffee, water and fruit juice will be available during the coffee breaks at the times stated in the programme. Buffet lunches and evening meal will be served in the lunch room (“Ormes et Cèdres”). On Monday evening, a buffet lunch will be served during the poster session. Toilets are situated close to the presentations rooms and Dining Room, and are clearly signposted.

INTERNET ACCESS

Free WiFi access is available in Valpré.

SMOKING POLICY

Valpré is a designated no-smoking building. If you wish to smoke, please do so outside the buildings.

POSTER SESSION AND AWARDS

The poster session will take place on Monday from 18:30 to 21:00. Posters will also remain on display during the coffee breaks of the whole event. Authors who are willing to present their poster work are encouraged to stand close to it during the main poster session, ready for a discussion. Posters may be fixed from Sunday 16:00, and should be removed before 10:00 on Wednesday.

Approximately 60 posters are going to be exposed during the conference. During the closure session, a prize of 500 euros each will be attributed to the two best presented posters as judged by an independent committee.

Only authors who have submitted a full-length paper to Tribology International or to Journal of Engineering Tribology, prior to the beginning of the symposium will be considered for competition. Candidates should have stand close to their poster during the dedicated session to present their work. Young researchers will be favoured.

MAURICE GODET AWARD

To honour the memory of Professor Maurice Godet, a prize of 1000 euros will be given to the best oral presentation by a young researcher. To be eligible the criteria are as follow:

- the applicant have submitted a full-length paper to Tribology International or to Journal of Engineering Tribology, prior to the beginning of the symposium.
- the applicant is under 30 at the date of the symposium.
- the applicant is a registered PhD student or within 3 years of graduation of a research degree
- the applicant must present the work at the symposium.

• Speakers guidelines

Attend the Speakers' Breakfast (or Speakers' Coffee) at 7:30 (or at 13:15) in "Speakers Briefing/Breakfast" room (see Valpré Map) on the morning (or on the afternoon) of your session to meet the chairman personally.

Each room is equipped with a podium, screen, microphone, laptop computer and data projector. Presenters may bring their own laptop computer. All computers for a particular session will be active during the session with a port video switch used to allow a quick transition from one presenter to the next.

Hopefully, speakers will arrive at the meeting rooms at the beginning of the break to set up and test their equipment and presentation. Technical support will be available to assist.

The schedule for the sessions is important and so please respect your allotted presentation time:

- **Invited speakers : 30-35 minutes presentation plus 5-10 minutes for discussion/questions**
- **Parallel Session speakers: 15 minutes presentation plus 5 minutes for discussion/questions**

Thank you and enjoy the conference!



• Session chairs guidelines

SPEAKERS BRIEFING BREAKFAST/COFFEE

Attend the Speakers' Breakfast (or Speakers' Coffee) at 7:30 (or at 13:15) in "Speakers Briefing/Breakfast" room (see Valpré Map) on the morning (or on the afternoon) of your session to meet the authors personally. Tent cards will be placed at the center of each table indicating your session. A session folder for your session will be located on the table as well. The folder will contain your schedule, the addendum to show last minute changes to the program (changes and cancellations).

Ensure you have a full complement of speakers and to obtain some bibliographical details to introduce each speaker. Only the nominated presenter appears in the program.

Double-check with your speakers on required visual aids and remind your Chair Assistant to work with the Audio Visual Technician to be sure the equipment is in good working order prior to the session start time. Each room will be provided with a laptop computer, a projector and screen and a podium microphone.

AT THE SESSION

Begin on time and stay on schedule. Keep your opening remarks brief. Consider reminding the speaker that he has five minutes remaining time. If there is a no-show, do not move the later speakers up into the no-show slot. Presentations are scheduled in the program guide and changing times could result in attendees missing a presentation they were looking for. Rather, take a short "stretch break" until the next speaker.

Authors have been advised as follows:

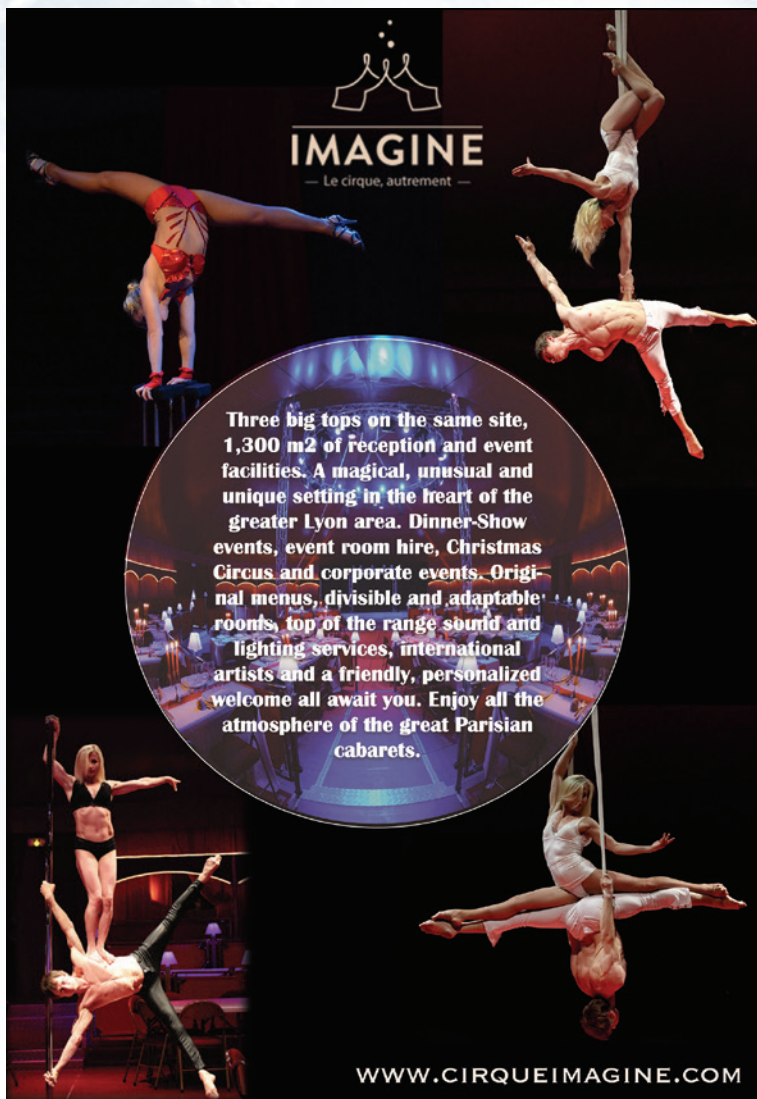
- **Invited speakers : 30-35 minutes presentation plus 5-10 minutes for discussion/questions**
- **Parallel Session speakers: 15 minutes presentation plus 5 minutes for discussion/questions**


Advise the speakers to stay within 30 cm of the microphone if using a podium microphone. Interrupt them if they stray from the mic.

Members and member representatives should conduct themselves and their activities in a professional manner marked by integrity and a spirit of fair play so as to not disrupt meeting activity.

Thank all speakers for their participation.

• Symposium banquet




IMAGINE
— Le cirque, autrement —

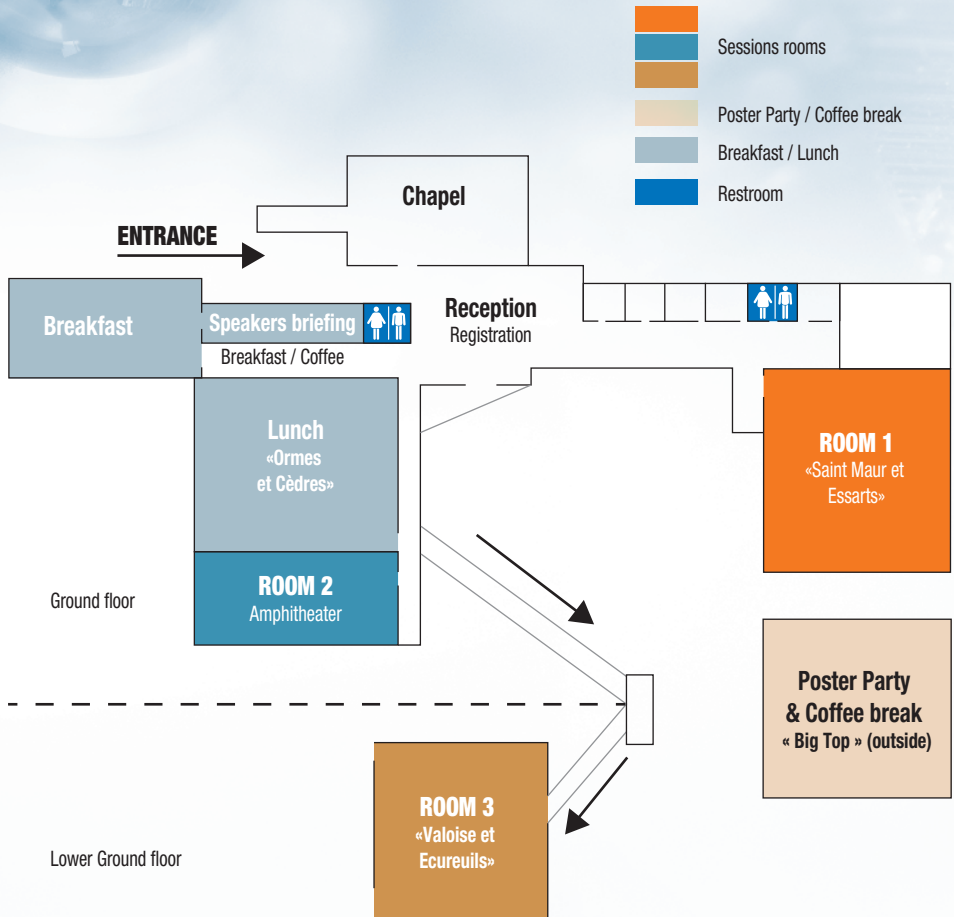
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Tribology

• Valpre MAP



Presentations will be held in the Room 1 (“Saint Maur/Essarts”), Room 2 (“Theater”) or Room 3 (“Vanoise et Ecoreuils”) signposted from reception. Poster session and coffee break will be held in room 4 located outside, under the big top, on the lawn. Please see the full programme for the appropriate room.

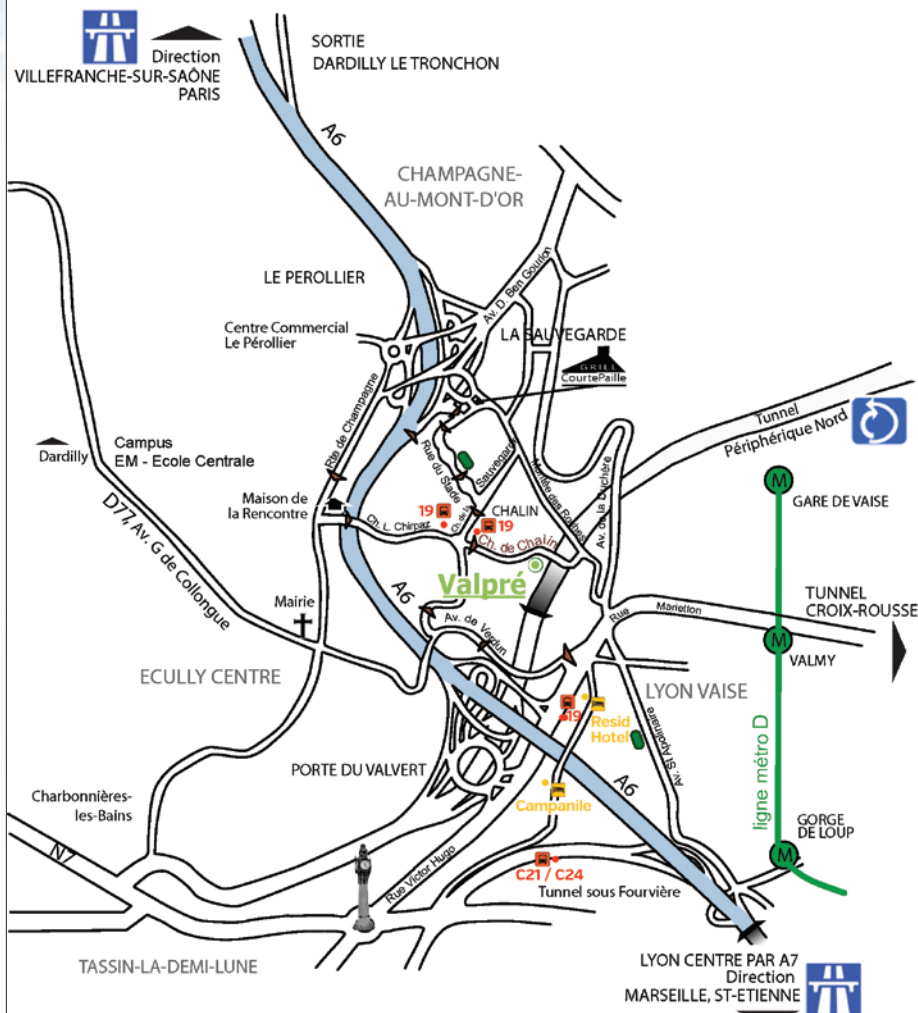
• Access MAP



Valpré Lyon

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Téléphone : 04 78 36 69 69
Bus C21/C24 - Arrêt Montribloud

Monday 7th September 2015

MORNING

8:00 - 9:20	
9:20 - 9:40	
9:40 - 10:20	Plenary -
10:20 - 10:40	
	ROOM 1
10:40 - 12:20	T5-1 50 years - Chair: J. Greenwood
10:40 11:00	Measurement and modelling of contact stiffness for rough contacts <i>David Nowell, University of Oxford, Department of Engineering Science</i>
11:00 11:20	Statistical Models of Nearly Complete Elastic Rough Surface Contact - Comparison with Numerical Solutions <i>Yang Xu, Mechanical Engineering Department, Auburn University</i>
11:20 11:40	Effect of roughness on surface force distributions measured by newly developed surface force analyzer with ultra-high accuracy <i>Takahisa Kato, The University of Tokyo</i>
11:40 12:00	Numerical approaches to rough contact mechanics: recent advancements and challenges <i>Daniele Dini, Imperial College London</i>
12:00 12:20	Normal stiffness and damping at lightly loaded rough planar contacts <i>Andres Soom, Department of Mechanical and Aerospace Engineering</i>
12:20 - 13:50	



Registration

Welcome address - Room 1

Invited speaker (Room 1) - Jim Greenwood - (Chair : S. Sallant)

BREAK

ROOM 2	ROOM 3
<p>T3-1 In situ - Chair: Y. Desplanques</p> <p>In situ observation of the magnetic domains in the process of friction Fumin Gao, <i>China University of Petroleum</i></p> <p>Study on Detection of Wear Transition Point Using Acoustic Emission Technique Alan Hase, <i>Saitama Institute of Technology</i></p> <p>Measurement of rolling contact surface deformation in micro scale Mohd Yusof Nurul Farhana, <i>School of Mechanical Engineering, Universiti Sains Malaysia</i></p> <p>Triboplasma generation at polymer contacts Debashis Puhon, <i>Tribology Group, Department of Mechanical Engineering, Imperial College London</i></p> <p>Observations on the Acoustic Emissions from a Line Contact Compressed into the Plastic Region Ramon Fuentes, <i>Leonardo Centre for Tribology, Department of Mechanical Engineering, The University of Sheffield</i></p>	<p>T4-1 Joint Tribology - Chair: M. Fillon</p> <p>The influence of variations in insert thickness on total knee replacement polyethylene wear Sean O'Brien, <i>University of Manitoba-Department of Mechanical Engineering</i></p> <p>Some insights from ceramic hip joints, in vitro = in vivo? Armelle Perrichon, <i>Centre Ingénierie et Santé</i></p> <p>A comparative study on the impact wear behaviors of human tooth enamel, ti6Al4v alloy and hydroxyapatite ceramic Jing Zheng, <i>Tribology Research Institute, Southwest Jiaotong University</i></p> <p>Adhesive potential of bio-inspired mushroom-shaped contacting counter-surfaces of different roughness Haytam Kasem, <i>Department of Mechanical Engineering, Azrieli College of Engineering, Tribology Labs. Israel Institute of Metals, Technion</i></p> <p>Wear modeling of metal-on-metal artificial hip joints by combining tribocorrosion and lubrication aspects Shoufan Cao, <i>Ecole Polytechnique Fédérale de Lausanne</i></p>

LUNCH + GROUP PICTURE AT 13:35

Monday
7th September
2015

AFTERNOON

13:50 - 14:30	Plenary -
14:30 - 14:40	
	ROOM 1
14:40 - 16:00	T2-1 Tribo (hard) materials - Chair: S. Jacobson
14:40 15:00	Nanolubricants developed from tiny cuo nanoparticles Salete Alves , <i>Federal Universitiy of Rio Grande do Norte</i>
15:00 15:20	Statistical approach to the Friction modelling in Boundary Lubrication Kosta Simonovic , <i>Laboratory for Tribology and Interface Nanotechnology, Faculty of Mechanical Engineering, University of Ljubljana</i>
15:20 15:40	Tribochemical wear of tetrahedral amorphous carbon in a low-friction tribosystem Stefan Makowski , <i>Fraunhofer Institute for Material and Beam Technology, Technische Universität Dresden</i>
15:40 16:00	Tribological properties of soft-metal / dlc composite coatings - Prepared by rf magnetron sputter using compound targets Goto Minoru , <i>Ube National College Of Technology</i>
16:00 - 16:20	
16:20 - 18:00	T2-2 Tribochemistry and wet lubrication - Chair: W. Liu
16:20 16:40	Mechanisms behind the promising tribological performance of a boric acid based lubricant additive Petra Olander , <i>Uppsala University</i>
16:40 17:00	Tribological properties of dialkylphosphonoacetic acid in biodegradable synthetic esters Tadashi Oshio , <i>Lubricants Research Laboratory, JX Nippon Oil & Energy Corporation</i>
17:00 17:20	Stability of friction fade-out at PLC films slid by ZrO ₂ pins under ethanol added hydrogen gas environment Takahisa Kato , <i>The University of Tokyo</i>
17:20 17:40	Boundary lubrication of aqueous copolymer lubricant: influence of copolymer concentration and applied pressure Thi Ta , <i>University of Wollongong</i>
17:40 18:00	Improvement of micropitting, wear, and friction behaviour utilising diamine-based surfactant and its effect on tribofilm formation in rolling-sliding condition Siavash Soltanahmadi , <i>Institute of Functional Surfaces, School of Mechanical Engineering, University of Leeds</i>
18:30 - 21:00	BUFFET -

Invited speaker (Room 1) - Weimin Liu - (Chair : S. Jacobson)

BREAK

ROOM 2	ROOM 3
T3-2 Mechanisms - Chair: M. Varga	T4-2 Skin Tribology - Chair: Y. Dubief
Transfer-grooving mechanism between blades and abra- dable coatings: consequences on blade vibration Yannick Desplanques , <i>Laboratoire de mécanique de Lille</i>	Measurement of the friction force of a pillar structure on a smooth surface Eray Turgay , <i>Department of Mechanical Engineering, Istanbul Technical University</i>
Effect of woven liners treated by lacl3 and ceo2 solutions on film formation mechanisms of self-lubricating spheri- cal plain bearings Ming Qiu , <i>Henan University of Science and Technology</i>	Multiscale Porous-Viscoelastic Model of the Skin and Subcutaneous Tissues: Preliminary Measurements on Pig Skin and Silicone Rubber Nestor Rodriguez , <i>Becton Dickinson and Co – Bo Pers- son, Peter Grubber Institute</i>
Understanding the behaviour of silver as a low friction coating in aerospace fasteners Giuseppe Tronci , <i>The University of Sheffield</i>	Friction and vibration criteria for tactile discrimination of pile fabrics Marie-Ange Bueno , <i>Laboratoire de Physique et Méca- nique Textiles</i>
Wear of new coated abrasive belt structures in automot- ive cranshaft multiscale finishing Mohamed El Mansori , <i>Arts et Métiers ParisTech</i>	Modelling the influence of moisture on the friction of human skin Siegfried Derler , <i>Swiss Federal Laboratories for Materials Science and Technology</i>

COFFEE BREAK

T3-3 Materials - Chair: P. Bellon	T5-2 Rough Elastomers - Chair: D. Nowell
The effect of martensitic volume fraction on abrasive wear as determined in a multi-pass dual-indenter scratch test Xiaojun Xu , <i>Delft University of Technology</i>	General theory of frictional heating with application to rubber friction Bo Persson , <i>Peter Grünberg Institut (PGI), Juelich</i>
Dry sliding peek against AISI 316 stainless steel for severe service Dearn Karl , <i>University of Birmingham</i>	Percolation of contact and non-contact: From single-wavelength roughness to self-affine surfaces Martin Mueser , <i>Forschungszentrum Jülich GmbH</i>
Pin on disc tribotests with the addition of cu particles as an interfacial media: characterization of disc tribosur- faces using sem-fib techniques Ana Cecilia Rodrigues , <i>Polytechnic School of the Univer- sity of São Paulo</i>	Bi-sinusoidal roughness modeling for soft mi- cro-elastohydrodynamic asperity lubrication in rough conformal contacts Bengt Wennehorst , <i>Leibniz Universität Hannover, Institute for Machine Design and Tribology</i>
A test rig for studying the frictional behavior of steels with sulfur powders Jianchun Fan , <i>College of Mechanical and Transportation Engineering, China University of Petroleum</i>	Role of surface roughness in radial shaft seals Joichi Sugimura , <i>Kyushu University</i>
Experimental study on ignition mechanisms of sulfur caused by friction Sun Bingcai , <i>College of Mechanical and Transportation Engineering, China University of Petroleum</i>	Sliding of an elastomeric/glass contact: optical study of the true contact area Julien Scheibert , <i>Laboratoire de Tribologie et Dynamique des Systèmes</i>

POSTER PARTY (ECUREUILS / VALOISE) - See details at the end of the programme

Tuesday 8th September 2015

MORNING

8:30 - 9:10	Plenary
9:10 - 9:20	
	ROOM 1
9:20 - 10:40	T1-1 Lubricated rough contacts - Chair: K. Venner
09:20 09:40	Roughness in soft ehl contacts - the complementary wave re-assessed <i>Christopher Hooke, School of Engineering</i>
09:40 10:00	The Effect of Roughness Features on Lubricant Flow Inside EHL Contact <i>Petr Sperka, Brno University of Technology</i>
10:00 10:20	Effects of the thermal conductivity on point EHL contacts with ridge and groove <i>Motohiro Kaneta, Brno University of Technology, Faculty of Mechanical Engineering</i>
10:20 10:40	A unified approach for characterizing multiple lubrication regimes involving multiscale plastic deformation <i>Chuhan Wu, The University of New South Wales</i>
10:40 - 11:00	
11:00 - 12:20	T1-2 EHL modelling - Chair: G. Bayada
11:00 11:20	Film Thickness in EHL Point Contacts under Pure Impact Revisited <i>Kees Venner, University of Twente</i>
11:20 11:40	Influence of thermal and mechanical properties of coatings on friction in elastohydrodynamic contacts <i>Wassim Habchi, Lebanese American University, Department of Industrial and Mechanical Engineering</i>
11:40 12:00	low degree of freedom elastohydrodynamic friction prediction: through the fast estimation <i>Shirzadegan Mohammad, Division of Machine Elements, Luleå University of Technology</i>
12:00 12:20	Model order reduction for ehd contacts considering structural dynamics <i>Jan Henrik Schmidt, Robert Bosch Gmb</i>
12:20 - 13:50	

- Invited speaker (Room 1) - Ivan Krupka - (Chair : K. Venner)

BREAK

ROOM 2	ROOM 3
T5-3 Rough Contact 1 - Chair: K. Wahl	T3-4 Nano - Chair: P. Stemplé
Elastic Contact Between Representative Rough Surfaces Vladislav Yastrebov , Centre des Matériaux, MINES Paris-Tech, CNRS UMR 7633	Tribological behaviour and adhesion of carbon nanotubes grafted on carbon fibres Claire Guignier , Laboratoire de Physique et Mécanique Textiles
Topological characterization and simulation of textured rough surfaces Claudia Borri , Institute for Advanced Studies	Friction of Carbon Tows and Fibres Michel Tourlonias , Laboratoire de Physique et Mécanique Textiles
Experimental investigation of plastic contact of rough steel surface against a hard flat Pawel Pawlus , Rzeszow University of Technology	A new methodology for measuring simultaneously the friction, wear, and plastic deformation of carbon-based materials at the micro- and nano-scale Esteban Broitman , Thin Films Physic Division, IFM, Linköping University
Implementation of FFT Algorithms to Contact Analyses of Engineering Surfaces Zhanjiang Wang , State Key Laboratory of Mechanical Transmission, Chongqing University	

COFFEE BREAK

T5-4 Lubricated Rough Contacts II - Chair: G. Adams	T3-5 Wear - Chair: R. Dwyer-Joyce
Influence of surface waviness on predictions of friction between cylinder liner and oil control ring Zlate Dimkovski , Halmstad University	Rolls wear characterization in hot rolling processes Camille Bataille , Laboratoire d'automatique et de mécanique industrielles et humaines
An averaged approach to asperity contact interactions for non-gaussian lubricated surfaces Michael Leighton , Loughborough University	High temperature sliding wear mechanisms under variation of loading conditions Markus Varga , AC2T research GmbH
Adhesion of rough contacts with bounded distribution of heights with Bradley-DMT model Michele Ciavarella , Politecnico di Bari	Wear testing of aerospace self-lubricating bearing liner materials Alastair Clarke , Cardiff Universit
Mechanical integrity of 3d rough surfaces during contact Maxence Bigerelle , Laboratoire d'automatique et de mécanique industrielles et humaines	The linear wear rate of a coated contact between a sphere and a flat surface Jian Song , Ostwestfalen-Lippe University

LUNCH

Tuesday
8th September
2015

AFTERNOON

13:50 - 14:30	Plenary
14:30 - 14:40	
	ROOM 1
14:40 - 16:00	T3-6 Coating - Chair: S. Jacobson
14:40 15:00	Multi-scale study of initial tool wear on textured alumina coating, and the effect of inclusions in low alloyed steel Roland Bejjani , Sandvik Coromant
15:00 15:20	Effect of silver molybdate on tribological performance of nickel-based composite coatings Li Jianliang , Nanjing University of Science and Technology
15:20 15:40	Tribology behavior of cu-mos2 composites during dry sliding Yinyin Zhang , Department of Mining and Materials Engineering, McGill University
15:40 16:00	Mechanical properties of 13c dlc films deposited by PBI&D Masahiro Kawaguchi , Tokyo Metropolitan Industrial Technology Research Institute
16:00 - 16:20	
16:20 - 18:00	T3-7 Fretting - Chair: S. Fouvry
16:20 16:40	Experimental Study of the Fretting Wear Behavior of Incoloy 800 Alloy at High Temperature Xiaoyu Zhang , Southwest Jiaotong University
16:40 17:00	Investigation on fretting wear behavior of Inconel 690 tube in water Xue Mi , Key Laboratory of Advanced Materials Technology, Ministry of Education, Southwest Jiaotong University.
17:00 17:20	Role of WS2, WS2+CrC and bonded coatings on damage and friction of inconel 718 flat rough surfaces at high temperature Julien Fortes Da Cruz , Laboratoire d'Ingénierie des Systèmes Mécaniques et des Matériaux
17:20 17:40	Cyclic crystal plasticity modelling of fatigue with application to fretting Ashton Patrick , National University of Ireland, Galway
17:40 18:00	Modelling of fretting in the pressure armour layer of flexible marine risers Sinéad O'Halloran , National University of Ireland, Galway
18:30 - 23:00	

Invited speaker (Room 1) - Pascal Bellon - (Chair : Y. Desplanques)

BREAK

ROOM 2	ROOM 3
T2-3 Damage, RCF and surfaces - Chair: G. Poll	T1-3 Lubrication applications I - Chair: C. Hooke
The effect of coatings and oil additives on the evolution of surface topography, wear and friction during running-in Piras Elio , SKF – Engineering and research centre, iFS - School of Mechanical Engineering - University of Leeds	Squeeze film tilt effects in microsystems John Tichy , Rensselaer Polytechnic Institute
Impact of Lubricant Formulation on Pitting of Manual Transmission Gears Benoit Lhostis , Matériaux, ingénierie et sciences	A Fully-Coupled Elasto-Hydrodynamic Model For Air Foil Thrust Bearings Andreas Lehn , Technical University Darmstadt
Combined friction measurements of thrust bearing washers (disks) - from macro to micro scale Florian Pape , Institute of Machine Design and Tribology	Numerical analysis of drag torque of a grooved surface in multi-disk clutches Benoit Lorentz , Karlsruhe Institute of Technology
Influence of subsurface plastic deformation on the running-in behavior of an AISi alloy Dominic Linsler , MikroTribologie Centrum	Wear of bearing bushes on run-in surfaces Claudia Lenauer , AC ² T research GmbH

COFFEE BREAK

T5-5 Adhesion and Cracks - Chair: T. Kato	T2-4 Boundary regime in ICE - Chair: T. Liskiewicz
Adhesive development and crack propagation in barnacle interfaces Kathryn Wahl , US Naval Research Laboratory	Analytical Study of Tribofilm Formation and Removal Generated by Zinc Dialkyl Dithiophosphate Ali Ghanbarzadeh , University of Leeds
Adhesive contact of rough surfaces Lars Pastewka , Karlsruhe Institute of Technology, Institute for Applied Materials, Department of Physics & Astronomy, Johns Hopkins University	Influence of coexisting functionalized polyalkylmethacrylates on the formation of zndtp-derived tribofilm Masabumi Masuko , Tokyo Institute of Technology
Adhesion of an Axisymmetric Asperity George Adams , Northeastern University	Dynamometer testing: the effects of fuel type on engine oil contamination, its properties and tribological response Tiago Cousseau , Polytechnic School of the University of São Paulo
Hysteresis behaviour in contact of rough metallic surfaces Tomoya Nakamura , Japan Aerospace Exploration Agency	Influence of artificially aged engine oil on the real time wear and the tribofilm forming in the piston ring – cylinder liner contact Sara Salopek , AC ² T research GmbH
Microscale analysis of adhesive contact between rough ductile metals Daniele Bortoluzzi , University of Trento	Engine Bearing Friction With High Soot Content in Engine Oils Omar Mian , MAHLE Engine Systems UK Ltd

BANQUET

Wednesday 9th September 2015

MORNING

8:30 - 9:10	Plenary
9:10 - 9:20	
	ROOM 1
9:20 - 10:40	T4-3 Teeth and Lipidic <i>Chair: M.A. Buengo</i>
09:20 09:40	Erosion behavior of human tooth enamel in the citric acid solution modified with polysaccharide food gums Liang Zheng , <i>Tribology Research Institute, Southwest Jiaotong University, Life Science and Engineering College, Southwest Jiaotong University</i>
09:40 10:00	Lipidic Membranes for Aqueous Lubrication ? Molecular Dynamics Studies Alexandru Botan , <i>Institut Lumière Matière</i>
10:00 10:20	Interfacial friction control with responsive soft matter Feng Zhou , <i>State Key Laboratory of Solid Lubrication</i>
10:20 10:40	Satellite droplet generation by breakup process of stretching liquid bridge Kentaro Tanaka , <i>Tokyo University of Marine Science and Technology</i>
10:40 - 11:00	
11:00 - 12:20	T4-4 Tactile and Joint - Chair: F. Massi
11:00 11:20	An active force controlled laparoscopic grasper by using a smart material actuation Murat Ilker , <i>Department of Mechanical Engineering, Istanbul Technical University</i>
11:20 11:40	The start-up friction properties of PVA/graphene oxide hydrogel as artificial articular cartilage Dangsheng Xiong
11:40 12:00	The Correlation between Perceptual Stimuli and Friction Characteristics of Finger Slid on the Molecular-Film-Coated Solid Surface Saiko Aoki , <i>Tokyo Institute of Technology</i>
12:00 12:20	Tribological Analysis Of The Friction Reduction In Tactile Stimulation Wael Ben Messaoud , <i>Laboratoire d'électrotechnique et d'électronique de puissance, Laboratoire de Physique et Mécanique Textiles</i>
12:20 - 13:50	

- Invited speaker (Room 1) - Yves Bubief - (Chair : F. Massi)

BREAK

ROOM 2	ROOM 3
T1-4 Experimental techniques in lubrication Chair: I. Krupka	T2-5 Techniques and macro devices Chair: M. Masuko
Comparison of maximum shear stress reached in traction tests with high pressure chamber measurements Norbert Bader , <i>Institute of Machine Design and Tribology</i>	Otto raman spectroscopy for thin film lubrication Sho Yada , <i>Nagoya Institute of Technology</i>
Ultrasonic Determination of Lubricant Film Thickness in an Automotive Transmission Journal Bearing Hiroyuki Suzuki , <i>The University of Sheffield</i>	Characterization of the dynamic behavior of lubricity fuels using vibration signals and multiresolution analysis Jose Oliveira Júnior , <i>Federal University Of Rio Grande do Norte</i>
Acoustic emission as an aid to understanding raceway damage in rolling element bearings Aaron Cockerill , <i>Cardiff University</i>	The action of penetrants for releasing seized bolts Parhaam Parikhaah , <i>University of Sheffield</i>
Forensic Analysis of damage inflicting debris particles in Rolling Contact Xiaolan Ai , <i>The Timken Company</i>	Ex-Situ ATR-FTIR Approach for Characterization of Thermal and Tribochemical Reactions of ZDDP on steel and DLC coatings Somayeh Akbari , <i>University of Ljubljana, Laboratory for Tribology and Interface Nanotechnology</i>

COFFEE BREAK

T1-5 Lubrication applications II - Chair: M. Fillon	T5-6 Rough Contact 2 - Chair: E. Tomanik
An elastohydrodynamic lubrication contact model for valve train simulation Matthias Meuter , <i>AVL Deutschland GmbH</i>	Effect of Cross-grooved Type Texturing on Initial Running-in under Lubricated Fretting Miki Okamoto , <i>Graduate School, Tokyo University of Marine Science and Technology</i>
Stability Characteristics of Herringbone-Grooved Aerodynamic Journal Bearings Mounted on Viscoelastic Supports Norifumi Miyanaga , <i>Kanto-Gakuin University</i>	Multigrid Solution for 3D Rough Contact Problems in Presence of Subsurface Heterogeneities Hugo Boffy , <i>SKF Engineering and Research Center</i>
Modelling the length of contact patch on dry, water- and snow-contaminated runways Jonathan Gerthoffert , <i>Service Technique de l'Aviation Civile</i>	Nanoscaled contact between elastic bodies with wavy surfaces Yong Hoon Jang , <i>School of Mechanical Engineering, Yonsei University</i>
Dynamic behaviour of the doctor blades used in paper industry Davide Bianchi , <i>Austrian center of competence for Tribology</i>	Contact Modeling in Finite Element and Boundary Element Analysis including the Simulation of Thermomechanical Wear Gary Dargush , <i>Department of Mechanical and Aerospace Engineering</i>

LUNCH

Wednesday
9th September
2015

AFTERNOON

ROOM 1	
13:50 - 15:10	T3-8 Surface topography - Chair: M. Bigerelle
13:50 14:10	Triboactive surfaces in multi-asperity nanotribology Philippe Stempfle , Institut FEMTO-ST
14:10 14:30	Investigation of material transfer in sliding friction, -topography or surface chemistry Viktoria Westlund , Uppsala Universitet
14:30 14:50	Study on cutting contact interactions of natural fiber reinforced plastic composites under milling Faissal Chegdani , Mechanics surfaces and materials processing
14:50 15:10	Measuring interface conditions in a cutting tool contact with reflected ultrasound Dlair Ramadan , Sheffield University
ROOM 2	
13:50 - 15:10	T1-6 Slipping surfaces - Chair: J. Tichy
13:50 14:10	The effect of viscosity on boundary slippage in hydrodynamiclubrication Feng Guo , School of Mechanical Engineering, Qingdao Technological University
14:10 14:30	Shear flow of confined lubricants over surfaces alternating slipping and non-slipping grains Daniele Savio , Karlsruhe Institute of Technology - Institute for Applied Materials
14:30 14:50	Oil transport in microchannels by means of capillary forces Joachim Klima , Robert Bosch GmbH, Karlsruhe Institute of Technology
14:50 15:10	Molecular dynamics simulation of a droplet sheared by solid walls Akinori Fukushima , Graduate School of Engineering, Tokyo University of Agriculture and Technology
15:10 - 15:30	AWARDS AND CLOSURE (ROOM 1)

Poster session

1-01	A comparison of thin film lubrication of hexadecane between iron and iron oxide surfaces: influence of surface corrugation	<i>Thi Ta</i>	University of Wollongong (Australia)
1-02	Friction mechanisms at the molecular scale in a lubricated contact under transient tribological conditions	<i>Alexia Crespo</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
1-03	Non-newtonian thd performance of a dynamically loaded journal bearing in mixed lubrication	<i>K M Jagadeesha</i>	P. E. S. College of Engineering, Mandya (India)
1-04	Effect of circular and elliptic texture patterns on friction reduction	<i>Mohammed Yousofi</i>	Mechanics surfaces and materials processing (France)
1-05	Tribological study of an aerodynamic thrust bearing in supersonic regime	<i>Florence Dupuy</i>	Laboratoire de Mécanique des Contacts et des Structures (France)
1-06	Load carrying capacity and friction of circular - flat piston ring under starved conditions	<i>Camille Pettavino</i>	Institut national des sciences appliquées de Lyon (France)
1-07	Friction analysis of a roller screw assembly	<i>Amina Baccar</i>	Institut national des sciences appliquées de Lyon (France)
1-08	Piston ring liner lubrication: improving convergence for deep grooves	<i>Marie-Pierre Noutary</i>	Institut national des sciences appliquées de Lyon (France)
1-09	Fluid inertia and viscoelasticity effects on turbochargers	<i>Benoit Remy</i>	Honeywell Turbo Technologies (France)
1-10	Mass conserving cavitation algorithms for slip/no-slip boundary condition	<i>Guy Bayada</i>	Institut national des sciences appliquées de Lyon (France)
1-11	3-D Observation of Rolling Contact Fatigue Crack Network in Nitrided Alloyed Steels	<i>Marion Le</i>	DCNS Group (France)
1-12	Investigations on truck axle efficiency: from spiral bevel and hypoid gears parameters to thermal influence	<i>Charlotte Fossier</i>	Volvo - Renault Trucks (France)
1-13	Influence of ball bearings modeling on the predicted thermal behavior of the fzg test rig	<i>Adrien Neurouth</i>	CEntre Technique des Industries Mécaniques (France)
1-14	A cfd study comparing surface texture features on stationary and entraining surfaces	<i>Nicholas Morris</i>	Loughborough University (United Kingdom)
1-15	Molecular dynamics study of lubricants: linking molecular structure and friction	<i>Michael Doig</i>	University of Edinburgh (United Kingdom)

1-16	A novel method for thermal ehl of non-newtonian fluid	<i>Qianqian Yang</i>	Yanfei Fang (China)
1-17	Theoretical and experimental investigation of scuffing : thermal modeling of a twin-disc machine	<i>Grégoire Isaac</i>	Laboratoire de Mécanique des Contacts et des Structures (France)
1-18	Effect of thin oil layer distribution on the themal EHL in impact motion	<i>Jing Wang</i>	Qingdao Technological University (China)
1-19	Film thickness and traction coefficient of thermally aged lubricating greases	<i>David Goncalves</i>	Instituto Nacional de Engenharia e Gestão Industrial, Faculdade de Engenharia (Portugal)
2-01	Clarification of Tribological Behavior on Tooth Surface of Resin Worm Wheel	<i>Takeshi Kunishima</i>	JTEKT CORPORATION (Japan)
2-02	Computational studies of reaction mechanism of modtc and its degradation	<i>Deepthi Jose</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
2-03	Wear models for ultra-low wear ? Separation of running-in and steady-state wear	<i>Claudia Lenauer</i>	AC ² T research GmbH (Austria)
2-05	Grease lubrication behavior under complex sliding conditions	<i>Laura Haviez</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
2-06	Effect of Lubricant Additives on Friction and Wear Behaviour in Boundary Lubrication Regime	<i>Kartik S. Pondicherry</i>	Anton Paar GmbH (Austria)
2-07	Lubricant additives optimization for contacts involving aluminum alloys and steel	<i>Catia Alves</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
2-08	Effect of modtc-containing oil degradation on steel/ steel and DLC/steel contacts	<i>Modestino De Feo</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
2-9	Understanding the influence of tribofilm composition on friction performance of friction modifier, modtc	<i>Doris Khaemba</i>	University of Leeds (United Kingdom)
2-10	Structural, Mechanical and Tribological Evaluation of Different DLC Coatings for IC Engine Components	<i>Vishal Khetan</i>	University of Leeds (United Kingdom)
2-11	The tribological performance and tribofilm formation on microwave pecvd diamond-like-carbon films under boundary lubrication conditions when lubricated by gear oil formulation	<i>Hongyuan Zhao</i>	University of Leeds (United Kingdom)
2-12	Thermal and frictional performance evaluation of nano lubricant with multi-walled carbon nano-tubes (mwcnt) as additive	<i>Lijesh K.p.</i>	Indian Institute of Technology (India)

3-01	Prediction of DLC friction lifetime based on a local Archard factor density approach	<i>Fathia Alkelae</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-02	Effects of changing blade tip morphology on wear mechanisms in abradable seal contacts	<i>Michael Watson</i>	The University of Sheffield (United Kingdom)
3-03	A comparison of microstructure modelling methods applied to thermally sprayed abradable coatings	<i>Michael Watson</i>	The University of Sheffield (United Kingdom)
3-04	Adhesion for single sinusoid: the Bradley-DMT-JKR models and comparisons	<i>Michele Ciavarella</i>	Politecnico di Bari (Italy)
3-05	The Coulomb law baseline solution for Fineberg experiments	<i>Michele Ciavarella</i>	Politecnico di Bari (Italy)
3-06	Investigation of the anti-wear ability of surface textured mechanical seal face made of polymer and metal	<i>Meiling Wang</i>	Nanjing University of Aeronautics and Astronautics (China)
3-07	Numerical investigation of frictional response when cutting hybrid CFRP/Ti stacks	<i>Jinyang Xu</i>	Mechanics surfaces and materials processing (France)
3-08	Microanalysis of third body material after dry sliding on cold sprayed al and al-al2o3	<i>Michael Shockley J.</i>	Department of Mining and Materials Engineering, McGill University (Canada)
3-09	Abrasive wear behaviour of conveyor belt rubbers at elevated temperature	<i>Markus Varga</i>	AC2T research GmbH (Austria)
3-10	Rupture fronts at the transition from static to kinetic friction: numerical modelling	<i>Julien Scheibert</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-11	Wear simulation in non-lubricated and mixed lubricated contacts taking into account the microscale roughness	<i>Stefan Reichert</i>	Karlsruhe Institute of Technology (Germany)
3-12	Roughness-induced jumping dynamics of a high velocity sliding mass under its own weight	<i>Chaima Zouabi</i>	LTDS Ecole Centrale de Lyon (France)
3-13	Tribology of thermoplastic polymers: correlation between thermo-mechanical and tribological properties	<i>Sana Touni</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-14	High temperature abrasion: Influence of load and MMC-matrix on the wear behaviour	<i>Markus Varga</i>	AC2T research GmbH (Austria)
3-15	Wear behavior of high chromium sintered steel under dynamic impact-sliding: effect of temperature	<i>Maha Messaadi</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)

3-16	Controlling the friction properties of rubber-sphere on rubber-coated-plane contacts: effect of the coating thickness	<i>Gael Pallares</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-17	Stick-slip in piezoelectric inertial motor: uncoupling of vibro-acoustic from tribological performances - mechanism approach	<i>Fabien Dubois</i>	Laboratoire de Mécanique des Contacts et des Structures (France)
3-18	Mechanical and chemical contributions to fretting wear in a ceramic versus metallic alloy contact	<i>Ariane Viat</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-19	High temperature fretting wear prediction of exhaust valve material	<i>Dhamasekaran Kesavan</i>	GE- Global Research Center, Bangalore, (India)
3-20	Semi-analytical model for coated contacts. Fretting wear simulation	<i>Hana Jerbi</i>	Laboratoire de Mécanique des Contacts et des Structures (France)
3-21	Influence of sulfurated atmosphere on the electrical contact resistance endurance subjected to fretting wear	<i>Julie Laporte</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-22	Evaluation of polymer joints for aircraft landing gear	<i>Peter Krier</i>	Department of Mechanical Engineering (United Kingdom)
3-23	Tribological performance at high temperature of a sputtered a-c coating doped with cr and si	<i>Mariana Henriette Staia</i>	Universidad Central de Venezuela (Venezuela)
3-24	Influence of sliding velocity and contact size on the tribological response of epoxy/steel interface	<i>Pierre Arnaud</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-25	Optimization of wear- resistance coating on steel substrate	<i>Ali Elwafi</i>	Ali Elwafi (Canada)
3-26	Friction power effect on Ti-6Al-4V fretting wear response	<i>Siegfried Fouvry</i>	Laboratoire de Tribologie et Dynamique des Systèmes (France)
3-27	Tribological assesment of the interface mold and plastic part	<i>Nicoleta Crisan</i>	Laboratoire de Mécanique des Contacts et des Structures (France)

4-01	Study on the biotribological properties of modified uhmwpe with surface texture and polymer brush	<i>Dangsheng Xiong</i>	X.D. Zhao (China)
4-02	The evaluation of the surface topography of friction pair elements after tribological tests	<i>Magdalena Niemczewska-Wojcik</i>	Cracow University of Technology, Institute of Production Engineering (Poland)
4-03	Tribocorrosion of hard-on-hard total hip replacements with metal and ceramic counterfaces	<i>Andrew Beadling</i>	Institute of Functional Surfaces (United Kingdom)
4-04	Tribological analysis of retrieved uhmwpe tibial implants in unicompartmental knee replacement	<i>Maria Sava Mirela</i>	Laboratoire de Mécanique des Contacts et des Structures (France)
4-05	Analysis of Fretting corrosion between cocrmo , cocrmo(1%Ti) against PEKK, PEKK(30%CF) and Ti6AL4V alloy as materials used in hip prothesis	<i>Ahmad Al Saabi</i>	Ecole des Mines de Saint-Etienne (France)
4-06	Tribological behavior of Pyrolytic carbon against bone promotes cartilage regeneration?	<i>Ghassene Ouenzerfi</i>	Laboratoire de Mécanique des Contacts et des Structures (France)
5-01	A very simple asperity model for rough contacts at very high pressures and comparisons	<i>Michele Ciavarella</i>	Politecnico di Bari (Italy)
5-02	Relevance of the scale used to calculate roughness in contact mechanics: the indentation case	<i>Julie Marteau</i>	Laboratoire Roberval (France)
5-03	The effect of hardness distribution by carburizing on the elastic-plastic contact performance	<i>Wenzhong Wang</i>	Beijing Institute of Technology (China)

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