# PROGRAMME

## TUESDAY 6 SEPTEMBER 2016

<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11:00 – 13:30</td>
<td><strong>Registration and lunch in the Dining Room (lunch will be served 12:00 – 13:30)</strong></td>
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<tr>
<td>13:30 – 13:45</td>
<td><strong>INTRODUCTION AND WELCOME</strong> Chaired by Professors Duncan Dowson and Anne Neville</td>
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<tr>
<td>13:45 – 17:30</td>
<td><strong>SESSION 1 – KEYNOTE PAPERS</strong> Chaired by Professor Anne Neville</td>
</tr>
<tr>
<td>13:45 – 14:30</td>
<td>Paper 1.1 <strong>Tribology in rolling bearing applications</strong> Pascal Ehret SKF, The Netherlands</td>
</tr>
<tr>
<td>14:30 – 15:15</td>
<td>Paper 1.2 <strong>Adaptive solid lubrication: new opportunities with nanoscale engineered materials</strong> Andrey Voevodin Material Science and Engineering, University of North Texas, USA</td>
</tr>
<tr>
<td>15:15 – 15:45</td>
<td>Refreshments in the Conference Suite</td>
</tr>
<tr>
<td>15:45 – 16:30</td>
<td>Paper 1.3 <strong>Lubrication in living systems: the molecular domain</strong> Jacob Klein Department of Materials and Interfaces, Weizmann Institute of Science, Israel</td>
</tr>
<tr>
<td>16:30 – 17:30</td>
<td><strong>TRIBOLOGY (THE JOST REPORT – 50 YEARS ON) – PANEL DISCUSSION SESSION</strong> Chaired by Dr Robert Ian Taylor</td>
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<tr>
<td>17:30 – 18:30</td>
<td><strong>POSTER SESSION AND DRINKS RECEPTION</strong> Conference Suite</td>
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<tr>
<td>18:30 – 23:00</td>
<td><strong>EVENING RECEPTION AND SYMPOSIUM DINNER</strong> Refectory, University of Leeds Coaches to depart at 18:30 prompt</td>
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<td>After Dinner Speaker – Professor W. Gregory Sawyer</td>
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<td>Time</td>
<td>Session</td>
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<tr>
<td>08:45 – 09:15</td>
<td>SESSION 2 – PLENARY PAPER 1</td>
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<td>Chaired by Professor Robert Wood</td>
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<td>Paper 2.1 Automotive engine tribology: 50 years of travel since the Jost Report</td>
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<td>09:30 – 10:30</td>
<td>PARALLEL SESSIONS 3 TO 6</td>
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<tr>
<td>Wednesday</td>
<td>SESSION 3 – EHL I</td>
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<tr>
<td>09:30 – 10:30</td>
<td>Chaired by Professor Benyebka Bou-Said</td>
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<td></td>
<td>Paper 3.1 Experimental study of EHL film thickness behaviour at high speed in ball-on-ring contacts</td>
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<td>Paper 3.2 The development of three-wavelength interferometry method for the calibration-less measurement of EHL film thickness distribution</td>
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<td>Paper 3.3 Wall slip in a 1-dodecanol lubricated EHL contact</td>
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<td>Wednesday</td>
<td>SESSION 4 – REAL-TIME/IN-SITU I</td>
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<td>09:30 – 10:30</td>
<td>Chaired by Professor Ardian Morina</td>
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<td>Paper 4.1 In-situ Raman observation of structural transformation of diamond-like carbon films under boundary lubrication</td>
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<td>Paper 4.2 Clarification of effect of transformed layer and lambda ratio on low friction coefficient of carbonaceous coating in oil lubrication by in-situ observation of friction area</td>
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<td>Paper 4.3 Acoustic emission signals detected in tribological phenomena on SPM</td>
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<td>Wednesday</td>
<td>SESSION 5 – FRICTION I</td>
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<td>09:30 – 10:30</td>
<td>Chaired by Professor Gerhard Poll</td>
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<td>Paper 5.1 Friction and trail formation of a planar ferrofluid bearing</td>
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<td>Paper 5.2 An analytical model for dynamic sliding friction of pencil leads on dry glass inclines</td>
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<td>Paper 5.3 Effect of ink components on tribological properties of ball-point pen</td>
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</table>
## Wednesday 09:30 – 10:30

**SESSION 6 – DLC/COATINGS I**  
Chaired by Dr Shahriar Kosarieh, Mary Hallaway Lecture Theatre

| Paper 6.1 | Assessing the durability of DLC coatings in highly loaded tribo-contact with nano- and micro-scratch testing  
Ben Beake\(^a\), Tomasz Liskiewicz\(^b\), Vlad Vishnyakov\(^c\), Norbert Schwarzer\(^d\)  
\(^a\)Micro Materials Ltd, UK  
\(^b\)Institute of Functional Surfaces, School of Mechanical Engineering, University of Leeds, UK  
\(^c\)Department of Engineering and Technology, University of Huddersfield, UK  
\(^d\)Saxonian Institute of Surface Mechanics, Germany |
|---|---|
| Paper 6.2 | Tribological properties of chlorine-containing amorphous carbon films deposited by PBiID  
Yuuki Tokuta\(^a\), Takashi Itoh\(^b\), Takahiko Shiozaki\(^b\), Masahiro Kawaguchi\(^c\)  
\(^a\)Tokyo Metropolitan Industrial Technology Research Institute Joto Branch, Japan  
\(^b\)FUJIMETAL Co. Ltd, Japan  
\(^c\)Tokyo Metropolitan Industrial Technology Research Institute, Japan |
| Paper 6.3 | Friction fade-out at DLC films sliding against ZrO\(_2\) pins in an H\(_2\) and N\(_2\) gas environment - An approach to Industrial application of superlubricity  
Masataka Nosaka\(^a\), Yushi Morisaki\(^a\), Tomoaki Fujiwara\(^a\), Masahiro Kawaguchi\(^b\), Takahisa Kato\(^a\)  
\(^a\)The University of Tokyo, Japan  
\(^b\)Tokyo Metropolitan Industrial Technology Research Institute, Japan |

### 10:30 – 11:00  
Refreshments in the Conference Suite

## Wednesday 11:00 – 12:50

**PARALLEL SESSIONS 7 TO 10**

**SESSION 7 – BEARINGS I**  
Chaired by Professor Philippe Vergne, Auditorium

| Paper 7.1 | An active aerostatic thrust bearing with flexure hinges and piezo actuator  
Luigi Lentini, Terenziano Raparelli, Vladimir Viktorov, Federico Colombò  
Politecnico di Torino, Italy |
|---|---|
| Paper 7.2 | Microstructure and compressive residual stress influences of nitrided alloyed steels on rolling contact fatigue crack mechanisms  
Marion Le\(^a,b,d\), Fabrice Ville\(^a\), Xavier Kleber\(^b\), Buffière Jean-Yves\(^b\), Jerome Cavoret\(^a\), Marie Christine Sainte Catherine, Laurence Briancon\(^d\)  
\(^a\)LaMCoS, INSA de Lyon, France  
\(^b\)Mateis, INSA de Lyon, France  
\(^d\)DGA, France  
\(^a\)DCNS Research, Indret, France |
| Paper 7.3 | Dynamic behaviour of journal bearings with zonal slip surfaces  
Anupam Bhattacharya, Jayanta Kumar Dutt and Raj Kumar Pandey  
Department of Mechanical Engineering, IIT Delhi, India |
| Paper 7.4 | Effect of texture pattern on the performance behaviour of journal bearings operating in mixed-lubrication regime: simulations with cavitation  
Anupam Bhattacharya, Raj Pandey, J.K. Dutt  
Department of Mechanical Engineering, IIT Delhi, India |
| Paper 7.5 | Self-lubricating composite bearings: effect of fiber length on its tribological properties by DEM modelling  
Maria Villavicencio\(^a\), Mathieu Renouf\(^b\), Aurélien Saulot\(^a\), Yann Michel\(^c\), Yves Maheo\(^d\), Guillaume Colas\(^a\), Tobin Filleter\(^e\)  
\(^a\)LaMCoS, INSA-Lyon, France  
\(^b\)LMGC, Université de Montpellier, France  
\(^c\)CNES, France  
\(^d\)SKF Aerospace, France |

*Department of Mechanical Engineering, University of Toronto, Canada*
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<tr>
<th>Session 8 – Wear I</th>
<th>11:00 – 12:50</th>
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| Paper 8.1 | Synergistic tribo-corrosion interaction between cavitation erosion and corrosion for nickel aluminium bronze in 3.5% NaCl solution  
Jahnabi Basumatary, Robert Wood  
National Centre of Advanced Tribology at Southampton (nCATS), University of Southampton, UK |
| Paper 8.2 | Investigation of fundamental processes in erosive wear caused by water droplet impingement on titanium alloys  
Alan T Martin\(^a\), Mark G Gee\(^b\), Andrew J Gan\(^b\), Rob S Dwyer-Joyce\(^a\), Allan Matthews\(^b\), Adrian Leyland\(^a\)  
\(^a\)The Leonardo Centre for Tribology, The University of Sheffield, UK  
\(^b\)National Physical Laboratory, UK |
| Paper 8.3 | Effect of tangential velocity on erosion of ASTM A-106 Grade B steel pipe under turbulent swirling impinging jet  
Cesar Sedano-De-La-Rosa\(^a\), Manuel Vite-Torres\(^a\), Ezequiel Gallardo-Hernandez\(^a\), Juan Laguna-Camacho\(^b\), Jesus Godínez-Salcedo\(^c\), Leonardo Farfan-Cabrera\(^a\)  
\(^a\)Instituto Politécnico Nacional, SEPI-ESIME-UG, Grupo de Tribología, Mexico  
\(^b\)Universidad Veracruzan, Facultad de Ingeniería Mecánica y Electrónica, Mexico |
| Paper 8.4 | Friction and wear properties of the urushi lacquer containing a solid lubricant  
Koichi Jotaki\(^a\), Masaaki Miyatake\(^a\), Shinya Sasaki\(^a\), Shigeka Yoshimoto\(^a\), Tadeusz Stolarski\(^b\)  
\(^a\)Department of Mechanical Engineering, Tokyo University of Science, Japan  
\(^b\)College of Engineering, Design and Physical Sciences, Brunel University, UK |
| Paper 8.5 | Contact size, frequency and normal force effects on Ti–6Al–4V fretting wear rate: a combined friction power – contact oxygenation approach.  
S. Fouvry, P. Arnaud, A. Mignot, P. Neubauer  
LTD – Ecole Centrale de Lyon, France |

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<th>Session 9 – Engine I</th>
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| Paper 9.1 | Shear rates in engines and implications for lubricant design  
Robert Taylor  
Shell Global Solutions, UK |
| Paper 9.2 | Effects of honed cylinder liner surface texture on tribological properties of piston ring liner assembly  
Wieslaw Grabon, Pawel Pawlus, Slawomir Wos, Waldemar Koszela  
Rzeszow University of Technology, Poland |
| Paper 9.3 | Development of a test method for a realistic, single-parameter dependent analysis of piston ring vs. cylinder liner contacts with a rotational tribometer  
Julian Biberger, Hans-Jürgen Füßer  
Daimler AG, Germany |
| Paper 9.4 | An ultrasonic viscometer for advanced in-situ understanding of lubricant base oils in engine oil applications  
Michele Schirru\(^a\), Robin Mills\(^a\), Rob Dwyer-Joyce\(^a\), Oliver Smith\(^b\)  
\(^a\)The Leonardo Center for Tribology, University of Sheffield, UK  
\(^b\)The Lubrizol Corporation, UK |
| Paper 9.5 | Engine tribology: The evolving understanding and the effect of new technologies  
Mahdi Mohammadpour\(^a\), Ramin Rahmani\(^a\), P.M Rahnejat\(^b\), Homer Rahnejat\(^a\), Duncan Dowson\(^c\)  
\(^a\)Loughborough University, UK  
\(^b\)Formerly at Imperial College, UK  
\(^c\)University of Leeds, UK |
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<td>11:00 – 12:50</td>
<td><strong>SESSION 10 – FRETTING/FATIGUE I</strong> Chaired by Dr Tomasz Liskiewicz, Room AF21</td>
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| Paper 10.1   | Investigation on the plasticity accumulation of Ti-6Al-4V fretting wear through decoupling the effect of wear and surface profile in finite element modelling  
Abdul L Mohd Tobi, Sean Leen, Wei Sun, Philip Shipway  
<sup>a</sup>Structural and Integrity Monitoring Research Group, Universiti Tu Hussein Onn Malaysia, Malaysia  
<sup>b</sup>Mechanical and Biomedical Engineering, NUI Galway, Ireland  
<sup>c</sup>Division of Materials, University of Nottingham, UK |
| Paper 10.2   | **Investigation of the Fan Blade Root Contact.**  
Marcello Caddeau, Rob Dwyer-Joyce, Matthew B. Marshall  
The Leonardo Centre for Tribology, University of Sheffield, UK |
| Paper 10.3   | Evolution of plasticity-based damage with wear in gross sliding fretting of a non-conforming Ti-6Al-4V contact  
Abdul L Mohd Tobi, Wei Sun, Philip Shipway  
<sup>a</sup>Structural and Integrity Monitoring Research Group, Universiti Tu Hussein Onn Malaysia, Malaysia  
<sup>b</sup>Division of Materials, University of Nottingham, UK |
| Paper 10.4   | Fretting wear behavior of plasma CrxNby coatings on gamma-TiAl alloy  
Xiangfei Wei, Pingze Zhang, Dongbo Wei, Hongyuan Zhao, Chun Wang, Tomasz Liskiewicz  
<sup>a</sup>College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, China  
<sup>b</sup>School of Mechanical Engineering, University of Leeds, UK |
| Paper 10.5   | Fretting corrosion of metal on ceramic contacts for total hip replacement  
Michael Bryant  
School of Mechanical Engineering |
| 12:50 – 14:00| Lunch in the Dining Room                                                               |
| 14:00 – 15:30| **PARALLEL SESSIONS 11 TO 14**                                                          |
| Wednesday    | 14:00 – 15:30 **SESSION 11 – EHL II** Chaired by Dr Mark Wilson, Auditorium              |
| Paper 11.1   | Contact and wear TEHL model validation for engine bearings  
Konstantinos Kalogiannis, David Merritt, Omar Mian  
MAHLE Engine Systems, UK |
| Paper 11.2   | Effects of profile errors on lubrication performance of helical gears  
Alastair Clarke, Hazim Jamali, Kayri Sharif, Pwt Evans, Robert Frazer, Brian Shaw  
<sup>a</sup>School of Engineering, Cardiff University, UK  
<sup>b</sup>College of Engineering, Karbala University, Iraq  
<sup>c</sup>Design Unit, Newcastle University, UK |
| Paper 11.3   | Traction and local temperatures measured in an EHL contact  
Norbert Bader, Gerhard Poli  
Leibniz Universitaet Hannover (IMKT), Germany |
| Paper 11.4   | Viscous dissipation in compressible lubricant oil flow  
Andrea Codrignani, Daniele Savio, Franco Magagnato, Bettina Frohnapfel  
<sup>a</sup>Institute of Fluid Mechanics, Karlsruhe Institute of Technology, Germany  
<sup>b</sup>Fraunhofer Institute for Mechanics of Materials IWM, Germany |
### SESSION 12 – LUBRICANTS I
Chaired by Dr Filippo Mangolini, Room AG100

| Paper 12.1 | Influence of steel grade and microstructure on the performance of anti-wear additives  
Jakub Jelita Rydel, Konstantinos Pagkalis, Amir Kadiric, Pedro Rivera  
<sup>a</sup>SFK University Technology Centre, Department of Materials Science and Metallurgy, University of Cambridge, UK  
<sup>b</sup>SFK University Technology Centre, Tribology Group, Department of Mechanical Engineering, Imperial College, UK |
|---|---|
| Paper 12.2 | Capturing molecular interactions in lubricants and fluid/solid interfaces: an overview of recent advances in modelling techniques  
Daniele Dini  
Department of Mechanical Engineering, Imperial College London, UK |
| Paper 12.3 | Anti-wear tribofilm growth in rolling bearings under boundary lubrication conditions  
Andreas Stratmann, Chia-Jui Hsu, Carsten Gachot, Gero Burghardt, Georg Jacobs  
<sup>a</sup>Institute for Machine Elements and Machine Design, RWTH Aachen University, Germany  
<sup>b</sup>Department of Material Science and Engineering, Saarland University, Germany |
| Paper 12.4 | Effect of free and dissolved water contamination on tribofilms from the interaction of borate-containing oils with ferrous surfaces  
Lukman Animashaun, Chun Wang, Anne Neville, Ardian Morina  
School of Mechanical Engineering, University of Leeds, UK |

### SESSION 13 – TEXTURE I
Chaired by Professor Pawel Pawlus, Room AF21

| Paper 13.1 | Role of surface topography and material properties on the real contact area behavior under static loading conditions  
Blaž Žugelj and Mitjan Kalin  
Laboratory for Tribology and Surface Nanotechnology, University of Ljubljana, Slovenia |
|---|---|
| Paper 13.2 | Tribological performance of laser surface texturing steel impregnated with supramolecular gel lubricant  
Qiangliang Yu, Meirong Cai, Feng Zhou, Weimin Liu  
<sup>a</sup>State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, China  
<sup>b</sup>University of Chinese Academy of Sciences, Beijing, China |
| Paper 13.3 | The use of anisotropic texturing for control of directional friction  
Ping Lu, Robert Wood, Mark Gee, Ling Wang  
<sup>a</sup>National Centre for Advanced Tribology at Southampton, University of Southampton, UK  
<sup>b</sup>National Physical Laboratory, UK |
| Paper 13.4 | Synthesis of biomimetic tribo-system by utilizing metal 3D printer  
Misa Yonehara, Chiharu Tadokoro, Shinya Sasaki, Hikaru Okubo, Kan Sugiyama  
<sup>a</sup>Department of Mechanical Engineering, Graduate School of Tokyo University of Science, Japan  
<sup>b</sup>Department of Mechanical Engineering, Tokyo University of Science, Japan |
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<th>Time</th>
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<th>Authors</th>
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<td>14:00 – 15:30</td>
<td>SESSION 14 – BIO I</td>
<td>Paper 14.1: The slippery science: mesh size control of friction in gels</td>
<td>A. A. Pitenis\textsuperscript{a}, J. M. Ureña\textsuperscript{a}, K. D. Schulze\textsuperscript{a}, A. C. Cooper\textsuperscript{a}, T.E. Angelini\textsuperscript{b,c}, W. G. Sawyer\textsuperscript{a,d}</td>
<td>\textsuperscript{a}Department of Mechanical and Aerospace Engineering, University of Florida, USA \textsuperscript{b}J. Crayton Pruitt Family Department of Biomedical Engineering, University of Florida, USA \textsuperscript{c}Institute for Cell Engineering and Regenerative Medicine, University of Florida, USA \textsuperscript{d}Department of Materials Science and Engineering, University of Florida, USA</td>
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<td>Paper 14.2: A water-responsive, gelatine-based human skin model</td>
<td>Agnieszka Dabrowska\textsuperscript{a,b}, Gelu Marius Rotaru\textsuperscript{b}, Fabrizio Spano\textsuperscript{b}, Christian Affolter\textsuperscript{c}, Giuseppe Fortunato\textsuperscript{b}, Sara Lehman\textsuperscript{b}, Sigfried Derler\textsuperscript{b}, Nicholas D. Spencer\textsuperscript{a}, Rene M. Rossi\textsuperscript{b}</td>
<td>\textsuperscript{a}Laboratory for Surface Science and Technology, ETH Zürich, Switzerland \textsuperscript{b}Laboratory for Protection and Physiology, EMPA-Swiss Federal Laboratories for Materials Science and Technology, Switzerland \textsuperscript{c}Laboratory for Mechanical Systems Engineering, EMPA-Swiss Federal Laboratories for Materials Science and Technology, Switzerland</td>
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<td>Paper 14.3: Superior lubrication mechanism in poly (vinyl alcohol) hybrid gel as artificial cartilage</td>
<td>Teruo Murakami\textsuperscript{a},b, Seido Yarimitsu\textsuperscript{a}, Nobuo Sakai\textsuperscript{c}, Kazuhiro Nakashima\textsuperscript{a}, Tetsuo Yamaguchie,Yoshinori Sawae and Atsushi Suzuki\textsuperscript{f}</td>
<td>\textsuperscript{a}Department of Medical Technology, Faculty of Fukuoka Medical Technology, Teikyo University, Omuta, Japan \textsuperscript{b}Professor Emeritus, Kyushu University, Fukuoka, Japan \textsuperscript{c}Division of Intelligent Mechanical Systems, Faculty of System Design, Tokyo Metropolitan University, Tokyo, Japan \textsuperscript{d}Department of Applied Science for Integrated System Engineering, Kyushu Institute of Technology, Kitakyushu, Japan \textsuperscript{e}Department of Mechanical Engineering, Faculty of Engineering, Kyushu University, Fukuoka, Japan \textsuperscript{f}Department of Materials Science, Yokohama National University, Yokohama, Japan</td>
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<td>15:30 – 16:00</td>
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<td>Refreshments in the Conference Suite</td>
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<td>16:00 – 17:30</td>
<td>PARALLEL SESSIONS 15 TO 18</td>
<td>Paper 15.1: Friction control with FMs and FM-inhibitors on paper clutch materials</td>
<td>Go Tatsumi, Shinji Hasegawa, Yuji Matsui, Yohei Susukida, Kohei Masuda, Yasushi Onumata and Osamu Kurosawa</td>
<td>JX Nippon Oil &amp; Energy Corporation, Japan</td>
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<td>Paper 15.2: Real time durability of tribofilms in the piston ring – cylinder liner contact</td>
<td>Sara Salopek\textsuperscript{a}, Thomas Wopelka\textsuperscript{a}, Claudia Lenauer\textsuperscript{a}, Martin Jech\textsuperscript{a}, Ardian Morina\textsuperscript{b}, Anne Neville\textsuperscript{b}</td>
<td>\textsuperscript{a}AC2T Research GmbH, Austria \textsuperscript{b}Institute of Functional Surfaces, University of Leeds, UK</td>
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<td>Paper 15.3: Experimental and modelling studies of textured piston-ring-liner contacts</td>
<td>Francisco Profito\textsuperscript{a,b}, Sorin-Cristian Vlădescu\textsuperscript{a}, Tom Reddyhoff\textsuperscript{b}, Daniele Dini\textsuperscript{b}</td>
<td>\textsuperscript{a}Department of Mechanical Engineering, Politecnico School of the University of São Paulo, Brazil \textsuperscript{b}Department of Mechanical Engineering, Imperial College London, UK</td>
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<td>Paper 15.4: Optimisation of surface texture to reduce friction in piston-liner contacts</td>
<td>Tom Reddyhoff, Sorin-Cristian Vlădescu</td>
<td>Imperial College London, UK</td>
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<td>Wednesday 16:00 – 17:30</td>
<td>SESSION 16 – LUBRICANTS II</td>
<td>Paper 16.1: Organic additive/ZDDP interactions for improved tribological performance</td>
<td>Muhammad Sohail Siddiqui</td>
<td>School of Mechanical Engineering, University of Leeds, UK</td>
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<td>Paper 16.2: Determination of inherent friction characteristic of ZnDTP-derived tribofilms formed inhomogeneously over the contact surfaces</td>
<td>Masabumi Masuko, Taku Sato, Saiko Aoki</td>
<td>Tokyo Institute of Technology, Japan</td>
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Molecular dynamics investigation of nanoscopic lubrication for engineering applications
Konstantinos Gkagkas\textsuperscript{a}, Miljan Dašić\textsuperscript{b}, Veerapandian Ponnuchamy\textsuperscript{c}
\textsuperscript{a}Advanced Technology Division, Toyota Motor Europe, Belgium
\textsuperscript{b}Scientific Computing Laboratory, University of Belgrade, Serbia
\textsuperscript{c}Abylsen Belgium, Belgium

Low friction properties of associated carboxylic acids induced by molecular orientation
Renguo Lu\textsuperscript{a}, Shigeyuki Mori\textsuperscript{b}, Hiroshi Tani\textsuperscript{a}, Norio Tagawa\textsuperscript{a}, Shinji Koganezawa\textsuperscript{a}
\textsuperscript{a}Faculty of Engineering, Kansai University, Japan
\textsuperscript{b}Faculty of Engineering, Iwate University, Japan

Wednesday 16:00 – 17:30
SESSION 17 – TEXTURE II
Chaired by Dr Tom Reddyhoff, Room AF21

Effect of both surface texturing on improvement of tribological properties of sliding elements
Slawomir Wos, Waldemar Koszela, Pawel Pawlus
Rzeszow University of Technology, Poland

Rubber tired metro: a study of the relation between track texture and skid resistance
Chiraz Khelifi\textsuperscript{a}, Malal Kane\textsuperscript{b}, Maieul Adenot Meyer\textsuperscript{a}
\textsuperscript{a}Siemens SAS, France
\textsuperscript{b}IFSTTAR, France

Hydrodynamic flow analysis for determination of the location of surface texture features
Nicholas Morris, Michael Leighton, Ramin Rahmani, Homer Rahnejat
Wolfson School of Mechanical and Manufacturing Engineering, Loughborough University, UK

Morphological furrows impact on tribology of oleophilic and oleophobic behaviour of metallic surfaces
Lukasz Wojciechowski\textsuperscript{a}, Krzysztof J. Kubiak\textsuperscript{b}, Thomas G. Mathia\textsuperscript{c}
\textsuperscript{a}Institute of Machines & Motor Vehicles, Poznan University of Technology, Poland
\textsuperscript{b}School of Computing and Engineering, University of Huddersfield, UK
\textsuperscript{c}Laboratoire de Tribologie et Dynamique des Systemes, Ecole Central de Lyon, France

Wednesday 16:00 – 17:30
SESSION 18 – BIO II
Chaired by Professor W. Gregory Sawyer, Mary Hallaway Lecture Theatre

Friction and wear behaviour of ceramic materials under unidirectional sliding with saline lubrication
Alastair Clarke\textsuperscript{a}, Hayley Wyatt\textsuperscript{a}, Christopher Moriarty\textsuperscript{b}, Graham Foster\textsuperscript{b}
\textsuperscript{a}School of Engineering, Cardiff University, UK
\textsuperscript{b}Calon Cardio Technology Ltd, UK

Evidence for the dissolution of molybdenum during tribocorrosion of CoCrMo alloy in the presence of serum proteins
Thiago Simoes\textsuperscript{a}, Michael Bryant\textsuperscript{a}, Steven Milne\textsuperscript{a}, Mary Ryan\textsuperscript{b}, Anne Neville\textsuperscript{a}, Andy Brown\textsuperscript{a}, Rik Brydson\textsuperscript{a}
\textsuperscript{a}University of Leeds, UK
\textsuperscript{b}Imperial College London, UK

Effect of tribocorrosion products in metal-metal modular fretting interfaces
Abimbola Oladokun, Michael Bryant, Richard Hall, Anne Neville
Institute of Functional Surfaces, School of Mechanical Engineering, University of Leeds, UK

A numerical and experimental analysis on the adhesive frictional contact of a bioinspired elastomeric pillar
İlker Murat Koç, Turgay Eray
Department of Mechanical Engineering, Istanbul Technical University, Turkey
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<th>Time</th>
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<td>08:45 – 09:15</td>
<td>SESSION 19 – PLENARY PAPER 2</td>
<td>The significance of 1/4: Leonardo da Vinci’s friction experiments roughly 500yr later</td>
<td>W. G. Sawyer<em>a, b, A. A. Pitenis</em>b, D. Dowsonc</td>
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<td>09:30 – 10:30</td>
<td>PARALLEL SESSIONS 20 TO 23</td>
<td>Effect of an edge at cup rim on contact stress during microseparation in ceramic-on-ceramic hip joints</td>
<td>Feng Liu*a, John Fisherb</td>
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<td>School of Mechanical and Power Engineering, North University of China, P.R. China</td>
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<td>Influence of the manufacturing finishing on the nano-scale wear resistance at the taper-trunnion interface in hip implants</td>
<td>Vanesa Martinez-Nogues, John C. Walker, Richard B. Cook</td>
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<td>National Centre for Advanced Tribology (nCATS), University of Southampton, UK</td>
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<td>Distributed pressure measurement for an unharmed grasped tissue in a laparoscopic surgery</td>
<td>Mithat Can Özın<em>a, Bilsay Sümer</em>b, Turgay Eray<em>c, İker Murat Koç</em>a</td>
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<td>09:30 – 10:30</td>
<td>SESSION 21 – DLC/COATINGS II</td>
<td>Effect of carbon diffusion on friction and wear properties of diamond-like carbon in boundary oil lubrication</td>
<td>Kouami Auxence Melardot Aboua<em>a, Noritsugu Umehara</em>a, Hiroyuki Kousaka<em>a, Xingrui Deng</em>a, Haci Abdullah Tasearkin*a, Yutaka Mabuchib, Tsuyoshi Higuchib, Masahiro Kawaguchic</td>
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<td>Department of Mechanical Science and Engineering, Graduate School of Engineering, Nagoya University, Japan</td>
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<td>Nissan Motor Co., Japan</td>
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<td>Tokyo Metropolitan Industrial Technology Research Institute, Japan</td>
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<td>Tribological behaviour of diamond like carbon (DLC) coating and Steel against atmospheric plasma spray (APS) under boundary lubrication conditions</td>
<td>Pushkar Deshpande<em>a, Minfray Clotilde</em>a, Fabrice Dassenoy<em>a, Benoit Thiebaut</em>b, Frederic Jamniass<em>b, Frederic Meuniers</em>b, Liuquan Yangc<em>b, Peter Ernst</em>b</td>
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<td>Laboratory of Tribology and System Dynamics, Ecole Centrale de Lyon, France</td>
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<td>Tribological behaviour of Mo–W doped carbon-based coating</td>
<td>Ruud Jacobs<em>a, Roel Tietema</em>a, Dave Doerwald<em>a, Geert-Jan Fransen</em>a, Papken Eh. Hovsepianb, Arutjun P. Ehiasarianb</td>
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<td>IHI Hauzer Techno Coating, The Netherlands</td>
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<td>Sheffield Hallam University, UK</td>
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**Thursday 09:30 – 10:30**  
**SESSION 22 – REAL-TIME/IN-SITU II**  
Chaired by Professor Shinya Sasaki, Room AF21

| Paper 22.1 | Transient characteristics of triboplasma generation  
Debashis Puhan, T Reddyhoff  
*Department of Mechanical Engineering, Imperial College London, UK* |
| Paper 22.2 | Development of an in-situ detection technique to measure hydrogen evolution from a lubricated tribological contact  
Erfan Abedi Esfahani\(^a\), Ardian Morina\(^a\), Bo Han\(^b\), Ileana Nedelcu\(^c\), Marcel C. P. van Eijk\(^c\), Anne Neville\(^a\)  
\(^a\)Institute of Functional Surfaces, University of Leeds, UK  
\(^b\)SKF Global Technical Centre China, China  
\(^c\)SKF Engineering and Research Centre, The Netherlands |
| Paper 22.3 | Monitoring hydrogen evolution in lubricated contacts  
Arnaud Ruellan, Amir Kadiric  
*Imperial College London, UK* |

**Thursday 09:30 – 10:30**  
**SESSION 23 – EHL III**  
Chaired by Dr Omar Mian, Mary Hallaway Lecture Theatre

| Paper 23.1 | TEHL simulation on the influence of lubricants on load-dependent gear losses  
Andreas Zieglertrum, Thomas Lohner, Karsten Stahl  
*Gear Research Centre (FZG), Technical University of Munich, Germany* |
| Paper 23.2 | Measuring lubricant speed profile in an EHL contact by particle tracking  
Petr Sperka, Ivan Krupka, Martin Hartl  
*Brno University of Technology, Czech Republic* |
| Paper 23.3 | Heterogeneous multiscale methods for the EHL of line contacts  
Gregory de Boer\(^a\), Leiming Gao\(^a\), Robert Hewson\(^b\), Harvey Thompson\(^b\)  
\(^a\)Department of Aeronautics, Imperial College London, UK  
\(^b\)School of Mechanical Engineering, University of Leeds, UK |

**10:30 – 11:00**  
Refreshments in the Conference Suite

**11:00 – 12:30**  
**PARALLEL SESSIONS 24 TO 27**

**Thursday 11:00 – 12:30**  
**SESSION 24 – ENGINE III**  
Chaired by Professor Rob Dwyer Joyce, Auditorium

| Paper 24.1 | Load carrying capacity and friction of an inclined circular-flat piston ring  
J Fang, N Biboulet, Antonius Lubrecht  
*INSA-Lyon, LaMCoS, France* |
| Paper 24.2 | Visualization of strain distribution in gear teeth under lubricated condition by photo-elasticity technique  
Daisuke Yamazaki, Shin Morishita  
*Yokohama National University, Japan* |
| Paper 24.3 | Determination of Newtonian viscosity using a multiple reflection ultrasonic technique  
Olivia Manfredi, Robin Mills, Rob Dwyer-Joyce  
*The Leonardo Centre for Tribology, University of Sheffield, UK* |

**Thursday 11:00 – 12:30**  
**SESSION 25 – LUBRICANTS III**  
Chaired by Dr Filippo Mangolini, Room AG100

| Paper 25.1 | Optical characterisation of tribofilms formed on cast iron surfaces  
Maria Miranda-Medina\(^a\), Sara Salopek\(^a\), Andras Vernes\(^a\), Martin Jech\(^a\)  
\(^a\)AC2T Research GmbH, Austria  
\(^b\)Institute of Applied Physics, TU Wien, Austria |
| Paper 25.2 | Study of the effect of ionic liquid on the abrasion resistance of anodized aluminium alloys  
Maria Del Mar Arres, Ana Eva Jimenez Ballesta, Joaquin Arias Pardilla, Gines Martinez Nicolas, Maria Dolores Bermudez Olivares  
*Materials Science and Metallurgical Engineering Research Group, Technical University of Cartagena, Spain* |
### Thursday 11:00 – 12:30

#### SESSION 26 – FRICTION II

**Chair:** Dr Daniele Dini, Room AF21

| Paper 25.3 | The structural, tribological, and rheological dependency of thin hexadecane film confined between iron and iron oxide surfaces on sliding conditions  
Thi Dinh Ta, A. Kiet Tieu, Hongtao Zhu, Buyung Kosasih, Qiang Zhu, Hoang The Phan  
*School of Mechanical, Materials and Mechatronic Engineering, University of Wollongong, Australia* |
| Paper 25.4 | Lubrication Strubeck curve characterisation of vegetable oil derived biodiesel  
Siti Hartini Hamdan¹, William Woel Fong Chong², Jo-Han Ng³  
¹University of Southampton Malaysia Campus, Malaysia  
²Universiti Teknologi Malaysia, Malaysia |

| Paper 26.1 | A two-scale elasto-plastic model of rough heterogeneous surfaces in dry contact  
Georg Vorlaufer, Andras Vernes, Andreas Pauschitz, Friedrich Franek  
*AC2T Research GmbH, Austria* |
| Paper 26.2 | A numerical approach to predict the performance of wiper blades  
Qian Wang⁷, Tom Reddyhoff⁷, Hilde Parton⁶, Nicolaas-Alexander Gotzen⁶, Wim Buseyne⁷, Daniele Dini⁷  
⁶Department of Mechanical Engineering, Imperial College London, UK  
⁷Robert Bosch Produktie N.V. Belgium |
| Paper 26.3 | Alteration of friction force for a harmonically excited bioinspired elastomeric pillar  
Turgay Eray, İlker Murat Koç, Bilsay Sümer  
*Department of Mechanical Engineering, Istanbul Technical University, Turkey* |

#### Thursday 11:00 – 12:30

#### SESSION 27 – BEARINGS II

**Chair:** Professor Fabrice Ville, Mary Hallaway Lecture Theatre

| Paper 27.1 | Modelling the EHD flange-roller end contact: experimental and numerical progresses  
Jean-David Wheeler⁸, David Philippon⁸, Nicolas Fillot⁸, Nicolas Devaux⁸, Guillermo E. Morales Espejel⁹, Philippe Vergne⁸  
⁸INSA Lyon, LaMCoS, France  
⁹SKF Engineering and Research Centre, The Netherlands |
| Paper 27.2 | Modeling of elastic finite-length space rolling-sliding contact problem  
Haibo Zhang, Wenzhong Wang, Shengguang Zhang, Ziqiang Zhao  
*School of Mechanical Engineering, Beijing Institute of Technology, P.R. China* |
| Paper 27.3 | New computational method of the ball/race contacts transverse loads of high speed ball bearings without race control hypothesis  
Christophe Servais, Jean-Luc Bozet  
*Cryotribology, University of Liege, Belgium* |
| Paper 27.4 | Combined numerical and experimental investigation of surface textured journal bearings  
Nicholas Morris⁸, Hamed Shahmohamadi⁸, Hiroyuki Suzuki⁸, Rob Dwyer-Joyce⁸, Homer Rahnejat⁸  
⁸Loughborough University, UK  
⁹The University of Sheffield, UK |

**12:30 – 13:30**  
**Lunch in the Dining Room**

**14:00-22:00**  
**SYMPOSIUM TRIP (RECEPTION AND BUFFET)**  
Visit to York, followed by dinner at National Railway Museum
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<tr>
<th>Time</th>
<th>Session</th>
<th>Paper Number</th>
<th>Title</th>
<th>Authors and Affiliations</th>
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<tr>
<td>08:45 – 09:15</td>
<td>SESSION 28 – PLENARY PAPER 3</td>
<td>28.1</td>
<td>Importance of adaptive multimode lubrication mechanism in natural synovial joints</td>
<td>Teruo Murakami a,b, Seido Yarimitsu c, Nobuo Sakai d, Kazuhiro Nakashima a, Tetsuo Yamaguchie and Yoshinori Sawae e</td>
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<td>Department of Medical Technology, Faculty of Fukuoka Medical Technology, Teikyo University, Omuta, Japan b Professor Emeritus, Kyushu University, Fukuoka, Japan Division of Intelligent Mechanical Systems, Faculty of System Design, Tokyo Metropolitan University, Tokyo, Japan Department of Applied Science for Integrated System Engineering, Kyushu Institute of Technology, Kitakyushu, Japan Department of Mechanical Engineering, Faculty of Engineering, Kyushu University, Fukuoka, Japan</td>
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<td>09:30 – 10:30</td>
<td>PARALLEL SESSIONS 29 TO 32</td>
<td>29.1</td>
<td>Numerical analyses of stress induced damage during a reciprocating lubricated test of FeCMo SPS sintered alloy</td>
<td>Newton Fukumasu a, Guido Boidi a, Vanessa Seriacopi a, Guilherme Machado b, Roberto Souza a, Izabel Machado a</td>
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<td>Surface Phenomena Laboratory, University of Sao Paulo, Brazil FCA Group, Brazil</td>
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<td>29.2</td>
<td>High temperature abrasion resistance of differently welded structural steels</td>
<td>Harald Rojacz a, Markus Varga a, Hannes Pahn b, Susanne Baumgartner b</td>
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<td>AC2T Research GmbH, Austria Voestalpine Böhler Welding Austria GmbH, Austria</td>
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<td>29.3</td>
<td>Corrosive-abrasive wear induced by soot in boundary lubrication regime</td>
<td>Farnaz Motamen Salehi, Doris Khaemba, Ardian Morina, Anne Neville</td>
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<td>School of Mechanical Engineering, University of Leeds, UK</td>
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<td>09:30 – 10:30</td>
<td>SESSION 29 – WEAR II</td>
<td>29.1</td>
<td>Effects of residual water during deposition on the friction properties of Si-containing a-C:H Films</td>
<td>Hotaka Shibasawa, Hiroyui Kousaka, Xingrui Deng, Noritsugu Umehara</td>
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<td>Department of Mechanical Science and Engineering, Nagoya University, Japan</td>
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<td>30.1</td>
<td>Tribo-chemical evaluation of carbon-based coatings with MoDTC evaluated under ferrous and non-ferrous lubricated contacts</td>
<td>Vishal Khetan a, Ganesh Kamath a, Anne Neville a, Ardian Morina a</td>
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<td>University of Leeds, United Kingdom; Vapor Technologies, Inc., United States</td>
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<td>30.2</td>
<td>Diamond like carbon coatings for improved tribological and mechanical performance of polymers</td>
<td>Sean Carley a, Hongyuan Zhao b, Chun Wang a, Tomasz Liskiewisz a, Anne Neville a</td>
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<td>School of Mechanical Engineering, University of Leeds, UK LGC, UK</td>
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<td>30.3</td>
<td>Surface modification of titanium alloy by friction reforming and heat treating and its wear resistance properties in seawater conditions</td>
<td>Chen Han, Tatsuhiro Jibiki, Takashi Sugawara</td>
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<td>Tokyo University of Marine Science and Technology, Japan</td>
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<td>Friday 09:30</td>
<td>SESSION 32 – BIO IV</td>
<td><strong>Paper 32.1</strong> A link between the tribology and corrosive degradation of metal-on-metal THRs&lt;br&gt;Andrew Beadling, Michael Bryant, Duncan Dowson, Anne Neville&lt;br&gt;Institute of Functional Surfaces, University of Leeds, UK</td>
<td><strong>Chaired by Dr Angela Pitenis, Mary Hallaway Lecture Theatre</strong></td>
<td><strong>Zhongwei Wang, Yu Yan, Lijie Qiao</strong>&lt;br&gt;Corrosion and Protection Center, Key Laboratory for Environmental Fracture, University of Science and Technology Beijing, China</td>
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<td>10:30 – 11:00</td>
<td>Refreshments in the Conference Suite</td>
<td><strong>Paper 32.3</strong> The effect of electrochemical corrosion conditions on the subsurface microstructure evolution of a CoCrMo alloy for artificial joint implants&lt;br&gt;Zhongwei Wang, Yu Yan, Lijie Qiao&lt;br&gt;Corrosion and Protection Centre, University of Science and Technology Beijing, China</td>
<td><strong>Zhongwei Wang, Yu Yan, Lijie Qiao</strong>&lt;br&gt;Corrosion and Protection Centre, University of Science and Technology Beijing, China</td>
<td><strong>10:30 – 11:00</strong> Refreshments in the Conference Suite</td>
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<td>11:00 – 12:50</td>
<td>PARALLEL SESSIONS 33 TO 36</td>
<td><strong>Paper 33.1</strong> Effect of counterface materials on dynamic recrystallized structure and wear resistance of nanostructured copper&lt;br&gt;Zhong Han, Bin Yao, Ke Lu&lt;br&gt;Shenyang National Laboratory for Materials Science, Chinese Academy of Sciences, P.R. China</td>
<td><strong>Chaired by Dr Tomasz Liskiewicz, Auditorium</strong></td>
<td><strong>Ignacio Tudela, Rolandas Verbiakas, Grazina Burmistroviene, Mayank Anand, Yi Zhang</strong>&lt;br&gt;Daido Metal Co., Ltd, UK</td>
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<td>11:00 – 12:50</td>
<td><strong>SESSION 33 – WEAR III</strong></td>
<td><strong>Paper 33.2</strong> Study of the cavitation resistance and mechanisms of tin-based coatings&lt;br&gt;Thawhid Khan, Anne Neville, Ardan Morina, Yukio Tamura, Hiroshi Yamamoto&lt;br&gt;*Institute of Functional Surfaces, School of Mechanical Engineering, University of Leeds, UK&lt;br&gt;#Komatsu Ltd., Japan</td>
<td><strong>Chaired by Dr Ali Ghanbarzadeh, Room AG100</strong></td>
<td><strong>Thawhid Khan, Anne Neville, Ardan Morina, Yukio Tamura, Hiroshi Yamamoto&lt;br&gt;*Institute of Functional Surfaces, School of Mechanical Engineering, University of Leeds, UK&lt;br&gt;#Komatsu Ltd., Japan</strong></td>
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<td>11:00 – 12:50</td>
<td><strong>SESSION 34 – BEARINGS III</strong></td>
<td><strong>Paper 34.1</strong> Determination of hydraulic losses in radial cylindrical roller bearings using CFD simulations&lt;br&gt;Achim Feldermann, Dennis Fischer, Stephan Neumann, Georg Jacobs&lt;br&gt;Institute for Machine Elements and Machine Design, RWTH Aachen University, Germany</td>
<td><strong>Chaired by Dr Ali Ghanbarzadeh, Room AG100</strong></td>
<td><strong>Vivek Bhardwaj, R. K. Pandey, V. K. Agarwal&lt;br&gt;Department of Mechanical Engineering, I.I.T Delhi, India</strong></td>
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<td>11:00 – 12:50</td>
<td><strong>SESSION 34 – BEARINGS III</strong></td>
<td><strong>Paper 34.2</strong> Experimental studies for the roles of MoS2 particles blended grease and textured races on the temperature rise, frictional torque, and dynamic behaviours of ball bearings&lt;br&gt;Vivek Bhardwaj, R. K. Pandey, V. K. Agarwal&lt;br&gt;Department of Mechanical Engineering, I.I.T Delhi, India</td>
<td><strong>Chaired by Dr Ali Ghanbarzadeh, Room AG100</strong></td>
<td><strong>Ioana Adina Neacsa, Georg Vorlauffer, Stefan J. Eder, Bernhard Scheichl, Friedrich Franek&lt;br&gt;AC2T Research GmbH, Austria</strong></td>
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| Friday     | **SESSION 35 – LUBRICANTS IV**   | Chaired by Professor Ardian Morina, Mary Hallaway Lecture Theatre | Paper 35.1 **Thermo-hydrodynamic analysis of nano-lubricant flow with carbon nanoparticles in tribological contacts**<br>Hamed Shahmohamadi, Ramin Rahmani, Homer Rahnejat, Colin Garner, Nick Balodimos<br>\(^a\)Loughborough University, UK<br>\(^b\)Specialist Lubricants Ltd, UK

Paper 35.2 **Synergy of lithium salt and non-ionic surfactant for significantly improved tribological properties of water-based fluids**<br>Yurong Wang, Qiangliang Yu, Lei Shi, Meirong Cai, Feng Zhou<br>\(^a\)State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, China<br>\(^b\)University of Chinese Academy of Science, Beijing, China

Paper 35.3 **Effect of hydrogen and oxygen partial pressure on the tribochemistry of silicon oxide-containing hydrogenated amorphous carbon**<br>Filippo Mangolini, Medard Koshigan, Mark Van Bentem, James Ohlhausen, John McClimon, James Hilbert, Julien Fontaine, Robert Carpick<br>\(^a\)Institute of Functional Surfaces, University of Leeds, UK<br>\(^b\)Laboratoire de Tribologie et Dynamique des Systemes, Ecole Central de Lyon, France

Paper 35.4 **Analytical pressure prediction in hydrodynamically lubricated line contacts under transient conditions, including geometric starvation**<br>M. Denni, N. Biboulet, A.A. Lubrecht<br>\(^a\)Hispano Suiza, France<br>\(^b\)INSA-Lyon, LaMCoS, France

**Friday**<br>
11:00 – 12:50 | **SESSION 36 – ENGINE IV**       | Chaired by Dr Liuquan Yang, Room AF21 | Paper 36.1 **Effect of soot on lubricating oils in static and boundary regime**<br>Kartik Pondicherry<br>Anton Paar GmbH, Austria

Paper 36.2 **Investigations on truck axle efficiency: thermal behaviour and hypoid gears parameters influence**<br>Charlotte Fossier, Fabrice Ville, Christophe Changenet, Denis Barday, Vincent Berier<br>\(^a\)INSA-Lyon, LaMCoS, France<br>\(^b\)ECAM Lyon, LabECAM, France<br>\(^c\)Volvo Group, France

Paper 36.3 **Temperature-Pressure dependance of limiting shear stress under Elastohydrodynamic lubrication**<br>Serigne Ndiaga Ndiaye, Laetitia Martinie, David Philippon, Philippe Vergne<br>INSA-Lyon, LaMCoS, France

12:50 – 13:30 | **Dowson Prize Award, Poster Prize award and Symposium Close**<br>Chaired by Professors Ardian Morina and Philippe Vergne | Auditorium | Lunch in the Dining Room
| 1 | Tribological performance of plasma chrome-carburizing of γ-TiAl alloy | Pingze Zhang, Dongbo Wei, Xiangfei Wei, Xiaohu Chen, Feng Ding  
College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, China |
|---|---|---|
| 2 | Tribological behavior of Ipcote coating on 300M steel | Chen Xiaohu, Zhang Pingze, Wei Dongbo, Wei Xiangfei, Ding Feng  
College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, China |
| 3 | Development of adhesion control method for thermoplastic resin by switching electric bias | Motoyuki Murashima, Noritsugu Umehara, Hiroyuki Kousaka  
Department of Mechanical Science and Engineering, Nagoya University, Japan |
| 4 | Sliding wear behavior of Ni-Cr alloying on Ti-6Al-4V based on double-glow plasma surface metallurgy technology | Dong-Bo Wei, Ping-Ze Zhang, Zheng-Jun Yao, Xiang-Fei Wei, Xiao-Hu Chen  
College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, China |
| 5 | Static and kinematic friction coefficients of carbon fiber bound brush against textured surface | Takuya Shitaka, Tsukasa Isogai, Noritsugu Umehara  
Department of Mechanical Science and Engineering, Nagoya University, Japan |
| 6 | Experimental study on the properties of plasma sprayed Al₂O₃ based insulation coatings on GCR15 steel substrate | Yingchun Li, Ming Qui, Qinglin Li  
School of Mechanical Engineering, Henan University of Science and Technology, China |
| 7 | Frictional properties of metal 3D printed ball joint | Kento Haruna, Shinya Sasaki, Chiharu Tadokoro, Kan Sugiyama  
Department of Mechanical Engineering, Tokyo University of Science, Japan |
| 8 | Measurement of adsorption behavior and adsorption film properties | Masaya Watanabe, Hikaru Okubo, Chiharu Tadokoro, Shinya Sasaki  
Department of Mechanical Engineering, Tokyo University of Science, Japan |
| 9 | Lubricated wear and friction performance of SPS sintered FeCMo and FeCCr powder mixtures | Guido Boidi², Newton Fukumasu², Guilherme Machado¹b, Izabel Machadoᵃ  
ᵃSurface Phenomena Laboratory, University of Sao Paulo, Brazil  
bFCA Group, Brazil |
| 10 | Friction on road surfaces contaminated by fine particles: some new experimental evidences | Yosra Hichri, Veronique Cerezo, Minh-Tan Do  
LUNAM, Ifsttar, France |
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<th>Page</th>
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| 11   | Optimisation of grease application to railway track across different test scales | Matthew Harmon, Roger Lewis  
Centre for Doctoral Training in Integrated Tribology, University of Sheffield, UK |                                                                             |
| 12   | Elastohydrodynamic lubrication of finite line contact with non-Gaussian rough surfaces | Dhanendra Dewangan, Mihir Sarangi  
Indian Institute of Technology Kharagpur, India |                                                                             |
| 13   | A non-invasive method for measurement of the interface conditions in metal rolling | Adeyemi Gbenga Joshua  
The Leonardo Centre for Tribology, Department of Mechanical Engineering, University of Sheffield, UK |                                                                             |
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