

38th LEEDS-LYON SYMPOSIUM ON TRIBOLOGY

LYON, 6 - 9 SEPTEMBER 2011

ENERGY AND HEALTH

FINAL PROGRAMME

The Symposium will be held at Amphitheater Lespinasse

INSA, 20, avenue Albert Einstein, Villeurbanne, France

TUESDAY 6th SEPTEMBER

09:00 - 14:00 **Registration** in hall of Amphitheatre Lespinasse

15:30 - 17:00 **OPENING SESSION - Amphi Lespinasse**

Chairman: J. Tichy

- “On the identification of wear modes and transitions using airborne wear particles generated from sliding steel on steel contact”, by **U. Olofsson** (KTH Machine Design, Stockholm, Sweden), **L. Olander** (KTH Building Services Engineering, Stockholm, Sweden).
- “Towards an Understanding of the Drilling Process for Fossil Fuel Energy: A Continuum-Discrete Approach” by **C. Fred Higgs III** (Carnegie Mellon University, USA)

17:30 **Departure for SYMPOSIUM DINNER**

*Meeting point Avenue Jean Capelle
in front of Amphitheater Lespinasse*

WEDNESDAY 7th SEPTEMBER
(Morning)

08:30 - 09:15 *OPENING LECTURE - Amphi Lespinasse*

Chairman: J.P. Rieu

- “Importance of Adaptive Multimode Lubrication Mechanism in Natural and Artificial Joints, by **T. Murakami** (Kyushu University, Fukuoka, Japan).

9:20 - 10:40 *SESSION I - Amphi Lespinasse*

Chairman: J.P. Rieu

BIO-MOLECULAR LUBRICATION

- “Synovial fluids physicochemical analysis role of the interactions between biological lubricants mole” by **D.A. Mirea** (Université de Lyon, Univ. Lyon-1 & Laboratoire PMCN, Villeurbanne, France), **A.M. Trunfio** (Université de Lyon, LaMCoS, Villeurbanne, France), **I. Matei** (Université de Lyon, Univ. Lyon-1 & Université de Lyon, LaMCoS, Villeurbanne, France) , **A. Piednoir**, **J.P. Rieu**, **M.G. Blanchin** (Université de Lyon, Univ. Lyon-1 Villeurbanne France), **Y. Berthier** (Université de Lyon, LaMCoS, Villeurbanne, France)
- “Dynamic Friction and Adhesion Characteristics of a Micro-Structured Pad to a Peritoneal Tissue” by **R. Roshan**, **A. Montellano Lopez**, **T. Liskiewicz**, **A. Morina** (University of Leeds, Institute of Engineering Thermofluids, Surfaces & Interfaces, **D.G. Jayne** (St. James’s University Hospital, Leeds, UK), **A. Neville** (University of Leeds, Institute of Engineering Thermofluids, Surfaces & Interfaces, Leeds, UK).
- “Effect of protein adsorbed on UHMWPE and CoCrMo alloy on friction property” by **K. Nakashima**, **Y. Sawae**, **T. Murakami** (Kyushu University, Japan), **S. Mischler**, (EPFL, Switzerland).
- “Attachment control of biological molecules through the optimization of the physico-chemical reactivity of the rubbing surfaces of joint implants with the view of controlling the wear”, by **N. Wang** (Université de Lyon, LaMCoS, Villeurbanne, France & Laboratoire PMCN, Villeurbanne, France), **A.-M. Trunfio** (Université de Lyon, LaMCoS, Villeurbanne, France), **D. Portinha**, **E. Fleury** (Université de Lyon, CNRS, LMM , **Y. Berthier** (Université de Lyon, LaMCoS, Villeurbanne, France) , **J.-P. Rieu** (Laboratoire PMCN, Villeurbanne, France).

09:20 - 10:40 *SESSION II - Room Blake & Mortimer*

Chairman: M. Priest

FLUID FILMS BEARINGS

- “Accurate and reliable friction prediction in journal bearings: a validated approach & applications” by **H. Allmaier**, **C. Priestner**, **H.H. Priebisch** (Virtual Vehicle Competence Center, Graz, Austria), **C. Forstner** (MIBA Bearing Group, Laakirchen, Austria), **F. Novotny-Farkas** (OMV Refining & Marketing GmbH, Wien, Austria).
- “Experimental study of a hydrodynamic thrust bearing with a parallel flat surface” by **Y. Henry**, **J. Bouyer**, **M. Fillon** (Institut Pprime, CNRS – Université de Poitiers– ENSMA, Futuroscope Chasseneuil France), **F. Delamour** (SNECMA, Groupe SAFRAN, Moissy-Cramayel, France).
- “Gas foil bearings’ behavior in refrigerating gas”, by **M. Garcia**, **B. Bou-Said** (Université de Lyon, CNRS, LaMCoS, France), **J. Rocchi**, **G. Grau** (LTS, Toulouse, France).
- “Cinderella in fluid film lubrication: stretch effects in radial lip seals” by **H. van Leeuwen** (Shell Global Solutions Hamburg, Germany & Eindhoven University of Technology, the Netherlands), **R. Petterson** and **K. Meesters** (Eindhoven University of Technology, the Netherlands).

09:20 - 10:40 *SESSION III - Room Corto Maltese*
CONTROL OF FRICTION AND WEAR

Chairman: Y. Desplanques

- “Accurate Control of Friction with Nanosculptured Thin Coatings: Application to Gripping in Microscale Assembly” by **P. Stempflié** (Institut FEMTO-ST ENSMM Besançon, France), **A. Besnard** (LaBoMaP, Arts et Métiers ParisTech de Cluny, France), **A. Domatti, N. Martin, J. Takadoum** (Institut FEMTO-ST ENSMM, Besançon, France).
- “Nano-roughness effect on the friction behaviour of amorphous glassy polymer surface” by **A. Rubin, C. Gauthier, R. Schirrer** (Strasbourg University, Institut Charles Sadron, Strasbourg, France).
- “Microstructural characterization of laser irradiated bulk copper under dry sliding conditions” by **B. Raillard, C. Gachot, F. Mücklich** (Saarland University, Department of Materials Science and Engineering, Saarbrücken, Germany).
- “Tribological properties of compocasted A356 aluminium alloy composite reinforced with Al₂O₃, SiC and graphite particles” by **A. Venci** (University of Belgrade Tribology Laboratory, Serbia), **S. Arostegui** (CSM Instruments SA, Switzerland), **I. Bobic** (Institute of Nuclear Science “Vinca”, Serbia).

10.40 – 11.00 BREAK

11:00 – 12:20 *SESSION IV - Amphi Lespinasse*
MULTISCALE MODELLING 1

Chairman: R.C. Coy

- “3D finite element computations of elastoplastic contact on a reference rough surface: influence of out of plane stiffness” by **B. Hagège, A. Jourani, P.-E. Mazeran, S. Bouvier, M. Bigerelle** (UTC, Laboratoire Roberval de Mécanique Compiègne, France).
- “A Multiscale Framework for EHL and micro-EHL” by **L. Gao and R. Hewson** (School of Mechanical Engineering, University of Leeds, UK).
- “A numerical model for mixed lubrication taking into account surface topography, tangential adhesion effects and plastic deformations” by **B. Lorentz, A. Albers** (Karlsruhe Institute of Technology (KIT), IPEK, Germany).
- “A semi-deterministic model of the piston ring-cylinder liner contact incorporating an oil availability model” by **A. Spencer, A. Almqvist, R. Larsson** (Division of Machine Elements, Luleå University of Technology, Sweden).

11:00 – 12:20 *SESSION V - Room Blake & Mortimer*
POWER LOSSES - GEARS

Chairman: F. Sadeghi

- “Comparison of tooth profiles and oil formulation focusing lower power losses”, by **R. Martins, I. Oliveira** (INEGI, Universidade do Porto, Portugal), **L. Magalhães** (ISEP - Instituto Superior de Engenharia do Porto, Portugal) and **J. Seabra** (FEUP, Universidade do Porto, Portugal).
- “Improving Wind Turbine Gearbox Reliability through Development of a Novel Bearing Concept and Sensor System”, **T P Howard, M B Marshall, R S Dwyer-Joyce** (Leonardo Centre for Tribology, University of Sheffield, UK).
- “The efficiency of a hypoid axle - a coupled, transient, thermal lubrication model” by **A. Kolekar and A. Olver** (Tribology Group Imperial College London, UK), **A.Sworski and F. Lockwood** (Valvoline/Ashland, Lexington KY, USA).
- “Thermal modeling of the fzg test machine”, by **J. Durand de Gevigney** (Université de Lyon, INSA-LaMCoS & Université de Lyon, ECAM Lyon France), **C. Changenet** (Université de Lyon, ECAM Lyon France), **F. Ville, P. Vexé** (Université de Lyon, INSA-LaMCoS, France).

11:00 – 12:20 *SESSION VI - Room Corto Maltese*

Chairman: S. Mischler

MEASUREMENT AND IDENTIFICATION OF FRICTION AND WEAR

- “A study of solid particle erosion on engineering materials” by **J. R. Laguna-Camacho**, **K. Reyes-Ortega**, **L. Y. Villagrán-Villegas** (Universidad Veracruzana Veracruz, México), **M. Vite-Torres** (SEPI-ESIME-IPN, México City), **C. A. Favela-Gallegos** (University of Sheffield, UK).
- “Condition monitoring of friction contacts with acoustic emission and radionuclide technique” by **A. Albers**, **S.G Kelemen**, (Karlsruhe Institute of Technology IPEK Germany).
- “On Identification of Wear Law for Viscoelastic Materials Based on the Results of Standard Wear Tests” by **A. Lyubicheva**, **I. Soldatenkov** (Russian Academy of Sciences, Russia).
- “Bearing Torque characteristics of Lithium soap Greases with some synthetic base oils” by **E. Oikawa**, **N. Inami**, **M. Hokao**, **A. Yokouchi**, (Research and Development center, NSK Ltd, Japan), **J. Sugimura** (Kyushu university, Japan).

WEDNESDAY 7th SEPTEMBER
Afternoon

14:00 – 15:40 *SESSION VII - Amphi Lespinasse*

Chairman: S. Glavatskikh

WEAR AND POLLUTION

- “Impact of Sulphuric Acid on Cylinder Lubrication for Large 2-Stroke Marine Diesel Engines: Contact Angle, Interfacial Tension and Chemical Interaction” by **F.A. Sautermeister**, **M. Priest**, **P.M. Lee**, **M. Fox** (University of Leeds, iETSI, UK).
- “Biofuel Ethanol Dilution into the Lubricant of a Fired Gasoline Engine under Cold-Start/Warm-Up Driving Cycles”, by **P.R. De Silva**, **M. Priest**, **P.M. Lee**, **R.C. Coy** (University of Leeds, iETSI, UK), **R.I. Taylor** (Shell Global Solutions, UK).
- “Sliding wear of 100Cr6 in a diesel-lubricated flat-flat contact under realistic loads” by **R. Barunovic**, **V. Haas**, (Robert Bosch GmbH Germany), **C. Langlade** (Université de technologie de Belfort-Montbelliard, France), **C. E. Krill III** (Institute of Micro and Nanomaterials, Ulm, Germany).
- “In situ sliding test and nanoindentation in the tem of inorganic fullerene like nanoparticles” by **I. Lahouija**, **F. Dassenoy**, **J.-M. Martin**, **B. Vacher** (University of Lyon, ECL-LTDS, France).
- “Abrasion under humid condition for tool steels H13 and AISI D2” by **M. Vite** (Instituto Politécnico Nacional, SEPI-ESIME. México), **I. Hilerio** (Universidad Autónoma Metropolitana, Mexico), **M.A. Barrón** (Universidad Autónoma Metropolitana, México).

14:00 – 15:40 *SESSION VIII - Room Blake & Mortimer*

Chairman: C. Langlade

NUMERICAL ANALYSIS OF CONTACTS - POLYMERS

- “Reducing the friction of polymers” by **M. Fox**, (Nylacast Ltd, Leicester UK)
- “Wave propagation during the sliding initiation at the frictional interface” by **M. Di Bartolomeo** (DIMA, University of Roma Italy & University of Lyon, LaMCoS, France), **F. Massi** (University of Lyon, LaMCoS, France), **L. Baillet** (ISTerre Grenoble University France), **A. Fregolent** (DIMA, University of Roma, Italy) **Y. Berthier** (University of Lyon, LaMCoS, France), **A. Culla** (DIMA, University of Roma, Italy).
- “Effect of frictional configuration and atmosphere on triboelectrification and triboluminescence of some polymers” by **K. Hiratsuka** and **K. Hosotani** (Chiba Institute of Technology, Japan).
- “The effect of surface defects on the wear of Nylon66 under dry and water lubricated sliding” by **A. Abdelbary**, **M. N. Abouelwafa**, **I.M. El Fahham** and **A. H. Hamdy** (Faculty of Eng., Alexandria University, Egypt).
- “Contamination of vacuum environment due to friction and wear” by **R.A. Nevshupa** (CISDEM (UPM-CSIC), Madrid, Spain).

14:00 – 15:20 *SESSION IX - Room Corto Maltese*
NON CONTINUOUS MODELLING IN TRIBOLOGY 1

Chairman: F. Higgs

- “Physically Representative Atomistic Modeling of Atomic-scale Friction” by **A. Martini**, **Y. Dong** (Purdue University, USA), **D. Perez** (Los Alamos National Laboratory, USA), **Q. Li**, **R. W. Carpick** (University of Pennsylvania, USA).
- “A theoretical investigation on the tribochemistry of C18 fatty acids on iron based surfaces using computational chemistry” by **S. Loehle** (Tohoku University Sendai Japan & Ecole Centrale de Lyon, LTDS, France & TOTAL, Solaize Research Center, France), **T. Onodera**, **K. Inaba**, **Y. Obara**, **Y. Sato** (Tohoku University Sendai Japan), **R. Nagumo** (New Industry Creation Hatchery Center, Sendai Japan), **R. Miura** (Tohoku University Sendai Japan), **Ai Suzuki** (New Industry Creation Hatchery Center, Sendai Japan), **H. Tsuboia**, **N. Hatakeyama**, **A. Endoua**, **H. Takaba** (Tohoku University Sendai Japan), **C. Matta** (Ecole Centrale de Lyon, LTDS, France & TOTAL, Solaize Research Center, France), **C. Minfray**, **J.-M. Martin** (Ecole Centrale de Lyon, LTDS, France), **R. Iovine**, **C. Pizard** (TOTAL, Solaize Research Center, France) and **A. Miyamoto** (New Industry Creation Hatchery Center, Sendai Japan & Tohoku University Sendai Japan).
- “Characteristics of Friction in Nanoscale Liquid Bridge” by **T. Tokumasu** (Institute of Fluid Science, Tohoku University, Sendai, Japan), **M.-H. Meurisse**, **N. Fillot** and **P. Vergne** (Université de Lyon, LaMCoS Villeurbanne France).
- “A wall slip model at the nanometer scale: fluid resistance to shearing versus surface corrugation » by **D. Savio**, **N. Fillot**, **P. Vergne** (Université de Lyon, LaMCoS Villeurbanne France).

15.40 – 16.00 BREAK

16:00 – 17:40 *SESSION X - Amphi Lespinasse*
TRIBOLOGY OF THE SENSES

Chairman: R. Dwyer-Joyce

- “Frictional relationship between woven fabrics and a polymeric finger tip” by **C. Aksu** (Namik Kemal University, Turkey), **I. M. Koc** (Istanbul Technical University, Turkey).
- “Ex-vivo investigation by atomic force microscopy of adhesive and friction properties of human skin” by **H. Gocerler** (Austrian Centre of Competence for Tribology, Wr. Neustadt, Austria), **A. Podestà** (CIMaINa and Dept. of Physics University of Milano Italy), **F. Cilurzo** (Dept. of Pharmaceutical Sciences, University of Milano, Italy), **K. Hendriks** (Philips Research, Eindhoven, Netherlands).
- “Friction and adhesion characterization and enhancement of fibrillar structures by using JKR apparatus” by **A. Guvenc** (Istanbul Technical University, Turkey), **I.M. Koc** (Istanbul Technical University, Turkey & Imperial College London, UK), **B. Sumer** (Hacettepe University, Turkey).
- “On the duplex model for tactile perception” by **R. Fagiani** (Université de Lyon, LaMCoS France & University "La Sapienza" of Rome, Italy), **F. Massi**, **E. Chatelet**, **Y. Berthier** (Université de Lyon, LaMCoS France), **A. Sestieri** (University "La Sapienza" of Rome, Italy).
- “Design of a piezoelectric based tactile sensor for 2-D pressure mapping with bio-inspired micro/nano pillars” by **E. Akca** (Istanbul Technical University, Turkey), **B. Sumer** (Hacettepe University, Turkey), **I.M. Koc** (Istanbul Technical University, Turkey).

16:00 – 18:00 **SESSION XI - Room Blake & Mortimer**
FRETTING OR IMPACT CONDITIONS

Chairman: U. Olofsson

- “Influence of the initial microstructure on the TTS formation induced by impacts on C45 steel” by **C. Langlade** (LERMPS Laboratory, UTBM, France), **G. Kermouche** (University of Lyon, ECL-ENISE, France).
- “Characterization of the damaged surface of a 304L austenitic stainless steel subjected to sliding impact in severe environment” by **A.-L. Kaiser** (Vallourec Research Aulnoye, France), **S. Bec** (Université de Lyon, ELC-LTDS, France), **C. Langlade** (LERMPS, Université de Technologie de Belfort-Montbéliard, France), **A. Beaudouin**, **W.-J. Chitty**, **J.-P. Vernot** (AREVA NP Technical Center, France).
- “Study on Bending Fretting Fatigue Damages of 7075 Aluminum Alloy” by **J. F. Peng**, **J. H. Liu**, **M. X. Shen**, **Z. B. Cai**, **J. Luo**, **M. H. Zhu** (Southwest Jiaotong University, , China).
- “Fretting Wear damage of Cu-Ni-In plasma coating / Ti17 interface: Influence of Ti17-TTS activation” by **S. Fouvry** (Université de Lyon, ELC-LTDS, France), **B. Van-Peteghem**, **C. Mary** (SNECMA Moteurs, Site de Villaroches, France)
- “Fretting behavior of DLC film coated on steel surface -Effect of surface modification by rubbing of fine particles conducted as pre-processing of DLC coating on fretting behaviour” by **H. Amezawa**, **M. Shima**, **T. Sugawara**, **Y. Kotera**, **Y. Konda**, **T. Jibiki** (Tokyo University of Marine Science and Technology, Japan), **H. Akita** (Hitachi Construction, Japan).
- “A scan thermal microscopy investigation into the thermal affected zone in dry fretting of titanium” by **H.A. Abdel-Aal** (Arts et Metiers ParisTech-Chalons-en-Champagne, France), **N. Trannoy** (Université de Reims, France), **A. Fabre**, **M. El Mansori**, **L. Barrallier** (Arts et Metiers ParisTech-Aix en Provence, France).

16:00 – 17:40 **SESSION XII - Room Corto Maltese**
POWER LOSSES - CONTACTS

Chairman: J. Sugimura

- “Fluid Rheology, Traction/Creep Relationships and Friction in Machine Elements with Rolling Contacts” by **G. Poll**, (Leibniz Universität Hannover, Germany)
- “Friction torque of cylindrical roller thrust bearings lubricated with windmill gear oils” by **C. Fernandes**, **R. Martins** (INEGI, Universidade do Porto, Portugal), and **J. Seabra** (FEUP, Universidade do Porto, Portugal)
- “Improvement of Friction Characteristics on Reciprocating Machinery by Micro Grooves” by **K. Iwamoto** (Tokyo University of Marine Science and Technology, Japan), **M. Oda** (Graduate school of Marine Science & Technology, Japan), **K. Tanaka** (Tokyo University of Marine Science and Technology, Japan), **T. Fujino** (Nagaoka University of Technology, Japan).
- “Thermal effects of different kind influencing lubricated non-conformal contacts” by **E. Ciulli** (University of Pisa, Italy).
- “Tribocemical characterization of Novel Boron-Dithiophosphates as Additives to Mineral Oils” by **F. Ullah Shah** (Luleå University of Technology, Div. Chem. Engrg, Sweden), **S. Glavatskikh** (Luleå University of Technology, Div. Mech. Engrg., Sweden & Ghent Univ., Belgium,) and **O. N. Antzutkin** (Luleå University of Technology, Div. Chem. Engrg, Sweden & University of Warwick, UK).

THURSDAY 8th SEPTEMBER

Morning

08:30 - 09:15 **OPENING LECTURE - *Amphi Lespinasse*** **Chairman: H. Van Leeuwen**

- “Measurements of Asperity Contact in Static and Dynamic Interfaces – Implications for Friction” by **R S Dwyer-Joyce** (University of Sheffield, Sheffield, UK),

09:20 – 10:40 **SESSION XIII - *Amphi Lespinasse*** **Chairman: H. Van Leeuwen**
ELASTOHYDRODYNAMIC LUBRICATION

- “Coupled Simulation of Starved EHL and Liquid Film Flow on Ball-on-Disc with Experimental Validation” by **K. Shibasaki, T. Maruyama**, (Basic Technology Research Center, NSK Ltd.,Japan), **M. Oshima** (The University of Tokyo, Japan)
- “Effect of surface velocity directions on elastohydrodynamic film shape” by **M. Omasta, I. Krupka, M. Hartl** (Brno University of Technology, Czech Republic).
- “Nonlinear Vibration Behaviour of EHL Contacts with Simplified Contact Models” by **B. Wiegert, H. Hetzler, W. Seemann** (Karlsruhe Institute of Technology (KIT), Germany).
- “Pressure and shear rate effects on boundary slippage in elastohydrodynamic lubricated contacts” by **X. M. Li** (City University of Hong Kong & Qingdao Technological University, P.R. China), **P. L. Wong** (City University of Hong Kong), **F. Guo** (Qingdao Technological University, P.R. China).

09:20 – 10:40 **SESSION XIV - *Room Blake & Mortimer*** **Chairman: K. Tanaka**
SURFACE ENGINEERING

- “Self-assembled monolayer (SAM) protective films for hybrid contacts” by **L. Wang, M. Nie, J. Rumbol** (University of Southampton, UK).
- “Influence of sliding velocity on adhesion forces in a nanometer scale contact” by **P.-E. Mazeran** (Laboratoire Roberval Compiègne, France), **H. Nasrallah, O. Noël** (Université du Maine, France).
- “How orientation structure of surface-adsorbed molecular layer affects its friction resistance” by **M. Masuko, T. Konishi, A. Suzuki** (Tokyo Institute of Technology, Tokyo, Japan).
- “Verification of the Advantages in Friction-Reducing Performance of Organic Polymers Having Multiple Adsorption Sites” by **S. Aoki, Y. Yamada, D. Fukada, A. Suzuki and M. Masuko** (Tokyo Institute of Technology, Department of Chemical Engineering Japan).

09:20 – 10:20 **SESSION XV – *Room Corto Maltese*** **Chairman: G. Stoica**
WEAR IN PROSTHESIS

- “Wear Analysis of Total Knee Replacement by Finite Element Simulation” by **S. O'Brien, Y. Luo and C. Wu** (University of Manitoba, MB, Canada), **J. Brandt** (Concordia Joint Replacement Group, MB, Canada).
- “Computational prediction of the wear of polyethylene total hip replacements: effect of clearances” by **F. Liu, F. Z. Jin, J. Fisher**, (Institute of Medical and Biological Engineering, University of Leeds, Leeds, U. K.)
- “The influence of concave dimples on the metallic counterface on the wear of UHMWPE” by **X. Zhou** (Wuhan University of Technology, P.R.China), **A. L Galvin, Z. Jin** (Institute of Medical and Biological Engineering University of Leeds, UK), **X. Yan** (Wuhan University of Technology P.R.China), and **J. Fisher** (Institute of Medical and Biological Engineering University of Leeds, UK).

10.40 – 11.00 BREAK

11:00 – 12:20 *SESSION XVI - Amphi Lespinasse*
MACHINE ELEMENTS

Chairman: G. Poll

- “Visualization of Grease Distribution in Rolling Bearing by Neutron Radiography” by **A. Ito, H. Nose** (Research Lab., IHI Corporation, Japan).
- “Experimental and Numerical Investigations on a Simulated Piston Ring-Liner Contact” by **E. Y. Avan** (University of Sheffield, UK), **W. Chong** (Cranfield University, UK), **R. Mills, R.S Dwyer-Joyce** (University of Sheffield, UK), **M. Teodorescu** (Cranfield University, UK).
- “Study on the combination seal for the high-speed turbopump” by **G.-Y. Zhang**, (Northwestern Polytechnical University Xi’an China), **W.-G. Zhao** (Xi’an Aerospace Propulsion Institute China), **X.-T. Yan** (University of Strathclyde, Glasgow UK).
- “Influences of adhesive wear and thermal degradation on the clutch frictional characteristics” by **A. Partogi Ompusunggu, T. Janssens, P. Sas, H. Van Brussel** (Katholieke Universiteit Leuven (KUL) Belgium)

11:00 – 12:20 *SESSION XVII - Room Blake & Mortimer*
COATING BEHAVIOR UNDER LUBRICATED CONDITIONS

Chairman: M. Masuko

- “Contact-less Thin Substrate Transport using Viscous Traction” by **R. A.J. van Ostayen** and **J. van Rij** (Delft University of Technology, Faculty of Mechanical, Maritime and Materials Engineering, The Netherlands)
- “Synergetic use of diamond-like carbon coating and multiply-alkylated cyclopentane oil for vacuum boundary lubrication” by **M. Iwaki** (Tohoku University, Japan & Aerospace Exploration Agency, Japan), **T. Takeno, H. Miki and T. Takagi** (Tohoku University, Japan).
- “Friction and wear properties of lead-free aluminum alloy bearing material with molybdenum disulfide layer by a reciprocating test” by **T. Miyajima, Y. Tanaka, Y. Iwai** (University of Fukui Japan), **Y. Kagohara, S. Haneda, S. Takayanagi, H. Katuki** (Daido Metal Co., Ltd Inuyama Japan).
- “Wet abrasive wear on ceramic materials obtained from solid residuals coming from mines” by **J. Vite-Torres** (Centro Nuclear, ININ, México), **M. Vite-Torres** (SEPI-ESIME-IPN México), **J. R. Laguna-Camacho, A. Marquina-Chávez** (Universidad Veracruzana México), **C. A. Favela-Gallegos** (University of Sheffield, UK).

11:00 – 12:20 *SESSION XVIII - Room Corto Maltese*
CONTINUOUS MODELLING OF LUBRICATED CONTACTS 1

Chairman: J. Bouyer

- “An efficient preconditioned iterative solution of fully-coupled elastohydrodynamic lubrication problems”, by **Sarfraz, .E Goodyer, P. K. Jimack** (School of Computing, University of Leeds, UK).
- “Model Order Reduction Techniques for the Solution of EHL Problems” by **W. Habchi** and **J. Issa** (Lebanese American University, Byblos, Lebanon).
- “Elastic deformation in thin film hydrodynamic lubrication” by **K. Yagi** and **J. Sugimura** (Kyushu University, Japan).
- “Increasing energy-efficiency of hydrodynamic journal bearings by means of condition monitoring and lubrication flow control” by **A. Albers, H.T Nguyen, W. Burger** (Karlsruhe Institute of Technology, IPEK Institute of Production Engineering, Germany).

THURSDAY 8th SEPTEMBER

Afternoon

14:00 - 14:45 *OPENING LECTURE - Amphi Lespinasse*

Chairman: F. Ville

- “Molecular Dynamics Simulations of Contact between Carbon-Based Materials: Isolating the Effects of Experimental Variables” by **J. Harrison** (United States Naval Academy, Annapolis, USA).

14:50 - 16:10 *SESSION XIX - Amphi Lespinasse*
ROLLING CONTACT FATIGUE 1

Chairman: F. Ville

- “Prediction of microgeometrical influences on micropitting fatigue damage on 32CrMoV13 steel with and without nitriding treatment” by **A. Fabre** (Arts et Métiers ParisTech Aix-en-Provence, France), **H.P. Evans** (Cardiff School of Engineering, UK)
- “Superfinish roller bearing components Effect of surface roughness on Rolling Contact Fatigue life” by **N. Jouini, P. Revel** (Laboratoire Roberval UTC/CNRS, France), **G. Thoquenne** (Cetim Senlis, France) and **M. Bigerelle** (Laboratoire Roberval UTC/CNRS, France).
- “Applicability of condition optimized peening on improvement of rolling contact fatigue Properties” by **H. Usami, K. Ishikawa** (Meijo university Nagoya Japan), **M. Ando** (Meijo university Nagoya Japan & IKK shot Co Tokai Japan) , **T. Endo** (IKK shot Co Tokai Japan), **H. Okochi and S. Ito** (Itoh kikoh Co. Ltd Tokai Japan)
- “The fatigue endurance limit of a high strength CrNi- steel in a fretting dominated Regime” by **T. Christiner, J. Reiser, I. Gódor, W. Eichlseder** (Montanuniversität Leoben Austria), **F. Trieb** , **R. Stuehlinger** (BHDT GmbH, Austria)

14:50 – 16:10 *SESSION XX - Room Blake & Mortimer*
BIO-TRIBO-CORROSION

Chairman: T Murakami

- “Biotribocorrosion: Some Electrochemical Observations from an Instrumented Hip Joint Simulator” by **J. Hesketh, D. Dowson, X. Hu, A. Neville** (iETSI, University of Leeds, Leeds, UK).
- “Identification between rotational fretting and rotational wear of PMMA/steel by means of tribo-noise and vibration signals” by **J. Yang** (Tribology Research Institute,,Southwest Jiaotong University, Chengdu, China & Ecole Centrale de Lyon), **J. L. Mo, Z. B. Cai, X. B. Xiao, M. H. Zhu** (Tribology Research Institute,,Southwest Jiaotong University, Chengdu, China).
- “Tribocorrosion performance of pulsed plasma nitrided orthopaedic CoCrMo alloy” by **A. Bazzoni** (NTNU, Faculty of Engineering Science and Technology, Trondheim, Norway & EPFL, Tribology and Interface Chemistry Lab Lausanne, Switzerland), **S. Mischler** (EPFL, Tribology and Interface Chemistry Lab Lausanne, Switzerland), **N. Espallargas** (NTNU, Faculty of Engineering Science and Technology, Trondheim, Norway).
- “Impact of repeated short-term deformation on surface topography and properties of silicone-hydrogel contact lenses”, by **J. Furgala** (Wrocław University of Technology, Poland, & Wrocław University of Environmental an Life Sciences, Poland), **M. Soboń, J. Detyna, C. Pezowicz** (Wrocław University of Technology, Poland), **J. Kuryszko** (Wrocław University of Environmental an Life Sciences, Poland).

14:50 - 15:50 *SESSION XXI – Room Corto Maltese*

Chairman: J. Tichy

CONTINUOUS MODELLING OF LUBRICATED CONTACTS 2

- “Numerical Investigations on the Influence of Mechanical Surfaces Waves on the dynamical Properties of Slider Bearings” by **H. Hetzler, W. Seemann** (Institute of Engineering Mechanics (ITM), Karlsruhe Institute of Technology, Karlsruhe, Germany).
- “On the Fully Turbulent Regime in Hydrodynamic Lubrication” by **B. Scheichl** (Austrian Center of Competence for Tribology, Austria & Institute of Fluid Mechanics and Heat Transfer, Vienna University of Technology, Austria), **A. Kluwick** (Institute of Fluid Mechanics and Heat Transfer, Vienna University of Technology, Austria).
- “Transient Analysis of Elastohydrodynamic Lubrication Using Multiphysics Software” by **X. Tan** (School of Computing, University of Leeds, Leeds, UK & Shell Global Solutions (UK)), **Ch. E. Goodyer, P.K. Jimack** (School of Computing, University of Leeds, Leeds, UK), **R. I. Taylor, M. A. Walkley** (Shell Global Solutions, UK).

16.10 – 16.30 **BREAK**

16:30 - 18:30 *SESSION XXII - Amphi Lespinasse*

Chairman: K. Hiratsuka

FRICITION AND WEAR IN EXTREM CONDITIONS

- “Failure of truck brake discs: a coupled numerical/experimental approach to identify critical thermo-mechanical loadings” by **M. Collignon** (Univ Lille Nord de France, France & ECLille & LML, France, & CNRS, UMR 8107, & CTIF, Sèvres France), **A-L. Cristol** (Univ Lille Nord de France & ECLille, LML & CTIF, Sèvres France), **P. Dufrenoy** (Univ Lille Nord de France & USTL LML & CTIF, Sèvres France), **Y. Desplanques** and **D. Balloya** (Univ Lille Nord de France & ECLille, LML & CTIF, Sèvres France).
- “Tribological adhesion issues of the rubber tyred contact” by **M. A. Cruz Gómez, E. A. Gallardo-Hernández** (SEPI, ESIME, Zacatenco, IPN México), **J. Reyes Gasca** (Instituto de Física UNAM, Mexico).
- “Investigation of rubber friction on snow” by **S. Ella** (Institute for Materials and Processes University of Edinburgh, UK), **P.-Y. Formagne** (Michelin, France), **V. Koutsos** and **J. R Blackford** (Institute for Materials and Processes University of Edinburgh, UK),
- “Experimental study of the effect of environment on crack propagation in minerals” by **A. Rusanov, C. Minfray, S. Bec, M. Guibert, and T. Le Mogne** (Université de Lyon, Ecole Centrale de Lyon, LTDS, France).
- “Influence of Rubber Properties on Sliding Friction” **A. Morozov, M. Dobychin** (A. Ishlinsky Institute for Problems in Mechanics, Moscow, Russia), **D. Charleux** (Michelin Clermont-Ferrand France)
- “Effects of applying a magnetic field during the deep cryogenic heat treatment on the wear behaviour of 1.2080 tool steel” by **A. Akhbarizadeh, S. Javadpour** (School of Engineering, Shiraz University Iran), **K. Amini** (Islamic Azad University Iran).

16:30 - 17:30 *SESSION XXIII - Room Blake & Mortimer*

Chairman: M. Bigerelle

NANOSTRUCTURES IN BIOTRIBOLOGY

- “Microtribology of CrN-based ternary and quaternary nanocomposite coatings for biomedical applications” by **M.J. Walock** (University of Alabama at Birmingham, USA & CER Arts et Métiers ParisTech of Cluny, France), **Y. Zou** (University of Alabama at Birmingham, USA), **I. Rahil, C. Nouveau** (CER Arts et Métiers ParisTech of Cluny, France), **A. Stanishevsky** (University of Alabama at Birmingham, USA).
- “Tribological behavior of different titanium structures in biological conditions” by **N. Crisan** (Politehnica University, IMST, Bucharest, Romania & Université de Lyon, INSA LaMCoS, Villeurbanne, France), **A-M. Trunfio-Sfarghiu** (Université de Lyon, INSA LaMCoS, Villeurbanne, France), **D. Gordin** (Laboratoire Sciences Chimiques INSA de Rennes, France), **G. Stoica** (Politehnica University, IMST, Bucharest, Romania), **A. Eleod, T. Torkoly** (Budapest University of Technology and Economics, Budapest, Hungary), **Y. Berthier** (Université de Lyon, INSA LaMCoS, Villeurbanne, France).
- “Torsional fretting wear of nitrogen ion implantation biomedical Ti6Al7Nb alloy” by **Z. B. Cai, M. H. Zhu, M. X. Shen** (Southwest Jiaotong University, Chengdu, China), **G. A. Zhang, L. P. Wang** (Lanzhou Institute of Chemical Physics, China).

16:30 – 17:50 **SESSION XXIV - Room Corto Maltese**
MULTISCALE MODELLING 2

Chairman: A. Martini

- “Effect of surface roughness on sliding friction by liquid meniscus bridge” by **K. Tanaka** (TOKYO Univ. of Marine Science and Technology, Japan), **K. Iwamoto** (ditto)
- “Mesoscopic Calculation of the Stribeck Curve at the DLC Contact Interface” by **H. Zhao, M. Wilson, A. Morina** and **Anne Neville** (University of Leeds, UK).
- “Modelling of the Hydrodynamic Support of Laser Surface Texturing on Cylinder Bore and Piston rings” by **E. Tomanik** (MAHLE Brazil), **F. Profito, D. Zachariadis** (São Paulo University, Polytechnical School, Brazil).
- “Energy efficiency optimisation of engine by frictional reduction of functional surfaces of cylinder ring-pack system” by **S. Mezghani, I. Demirci** (Arts et Métiers Paristech, LMPF, France), **M. El Mansori** (Arts et Métiers Paristech, LMPF France & Arts et Métiers Paristech, MécaSurf), **H. Zahouani** (Ecole Centrale de Lyon, LTDS, France).

19:40 prompt

Departure for Espace Tonkin by tram
Meeting point at “La Doua Gaston Berger” tram station
(tickets will be provided)

FRIDAY 9th SEPTEMBER
Morning

08:30 - 09:15 **OPENING LECTURE – Amphi Lespinasse**

Chairman: P. Vergne

- “Modeling of Microstructural Topology Effects on Rolling Contact Fatigue”, **F. Sadeghi** (Purdue University, West Lafayette, USA)

09:20 - 10:40 **SESSION XXV – Amphi Lespinasse**
ADDITIVES

Chairman: P. Vergne

- “Study of the interactions mechanisms between Dimethyl phosphite (DMPi) and tert-Butyl polysulfides (TPS44) by Gas phase lubrication” by **S. Mambingo Doumbe** (Université de Lyon, ELC-LTDS, France & Total Raffinage & Marketing, France), **M.-I. de Barros-Bouchet, Thierry le Mogne, Jean-Michel Martin**, (Université de Lyon, ELC-LTDS, France Alain Bouffet (Total Raffinage & Marketing, France).
- “Effect of dissolved water on ZDDP anti-wear performance and related tribochemistry in lubricated steel/steel pure sliding contacts”, by **H. Cen, A. Morina, A. Neville**, (iETSI University of Leeds, UK), **R. Pasaribu** (SKF Engineering and Research Centre, the Netherlands).
- “ZDDP-derived layer formation on steel-stainless steel contacts in lubricated rolling sliding conditions” by **A. Naveira Suarez** (SKF Engineering and Research Centre & Lulea University of Technology, Sweden), **F. Elam, R. Pasaribu** (SKF Engineering and Research Centre The Netherlands), and **R. Larsson** (Lulea University of Technology, Sweden).
- “Comprehension of friction behaviour of ZDDP tribofilm with an original dynamic tribometer” by **P. Njiwa, C. Minfray, M.Belin, E. Rigaud** and **J.-M. Martin** (Université de Lyon, ELC-LTDS, France).

09:20 - 10:40 **SESSION XXVI – Room Blake & Mortimer**
ROLLING CONTACT FATIGUE 2

Chairman: E. Ciulli

- “Oxidation of steel surface under repeated contact in hydrogen” by H. **Tanaka**, H.**Tanimoto**, T. **Otsu**, M. **Hashimoto**, (Kyushu University, Japan), J. **Sugimura** (Hydrogenius Japan).
- “Scuffing Performance of W-DLC Coated Gears” by B. **Kržan**, J. **Vižintin**, (University of Ljubljana, Slovenia), F. **Novotny-Farkas** (OMV Refining & Marketing GmbH, Austria).
- “Skidding behaviour of angular contact ball bearings under combined radial and axial loads, and time-varying operating conditions” by S. **Jain**, H. **Hunt** (University of Cambridge, UK)
- “Tribology of piston compression ring conjunction under transient thermal mixed regime of lubrication” by N. **Morris**, R. **Rahmani**, H. **Rahnejat**, P.D **King** (Loughborough University, UK) and B. **Fitzsimons** (Aston Martin Lagonda, UK).

09:20 - 10:40 **SESSION XXVII - Room Corto Maltese**
BIOTRIBOLOGICAL LUBRICATION

Chairman: B. Bou-Saïd

- “Measurement of rheological properties of biological fluids by a micro squeeze film damper » by S.**Huang**, D. **Borca-Tasciuc** and J. **Tichy** (Rensselaer Polytechnic Institute, Troy, NY, USA)
- “Dental De-Scaling and Surface Cleaning using Acoustic Waves” by C. **Rose**, R.**Dwyer-Joyce** (The University of Sheffield, UK).
- “The Tribology of De-husking Rice” by A. **Baker**, R. **Dwyer-Joyce** (The University of Sheffield, UK).
- “Water lubrication improved by low-friction proteins” by T.J. **Hakala**, P.**Laaksonen**, M.B. **Linder**, T. **Ahlroos**, A. **Helle** and K.**Holmberg** (VTT Technical Research Centre of Finland).

10.40 – 11.00 **BREAK**

11:00 - 12:00 **SESSION XXVIII - Amphi Lespinasse**
MECHANICAL PROPERTIES

Chairman: A. Eleod

- “An Expert System to Characterize the Surfaces Morphological Properties According to their Tribological Functionalities” by M. **Bigerelle** (Laboratoire Roberval Compiègne, France), T. **Mathia** (University of Lyon, ECL-LTDS, France), A. **Iost** (LML, ENSAM Lille, France), T. **Coorevits** (LML, ENSAM Lille, France & Laboratoire de Métrologie ENSAM, Lille), K. **Anselme** (Institut de Chimie des Surfaces et Interfaces, Mulhouse, France).
- “The Zero Level in Contact Measurement on Rough Surfaces” by J. **Marteau**, Y. **Xia**, P-E **Mazeran**, S. **Bouvier**, M. **Bigerelle** (Laboratoire Roberval, Compiègne, France).
- “The role of tribofilm growth on the frictional behavior of copper-diamond-like carbon nanocomposite coating” by M. **Goto** (Ube National College of Technology, Japan), J. **Fontaine**, S. **Bec**, (University of Lyon, ECL-LTDS, France), K. **Ito** (Nihon University, Japan), T. **Takeno** (Inst. of Int. Advanced Interdisciplinary Res. University International Tohoku, Japan), M. **Ruet** (University of Lyon, ECL-LTDS, France), H. **Miki** (Institute of Fluid Science, Tohoku University, Japan), M. **Belin**, T. **Le Mogne** (University of Lyon, ECL-LTDS, France)

11:00 - 12:00 **SESSION XXIX - Room Blake & Mortimer**
CERAMICS

Chairman: S. Bec

- “Advanced Ceramics as Friction Material in Lubricated Clutch Systems” by A. **Albers**, J. **Bernhardt**, S. **Ott**, (Karlsruhe Institute of Technology (KIT) IPEK, Germany).

- “Fatigue life of thicker TiN and CrN coatings in Rolling Contact” by **E. E. Vera** (Universidad Politécnica de Pachuca México), **M. Vite** (Instituto Politécnico Nacional, México), **R. Lewis** (University of Sheffield, UK).
- “Lubricated Hybrid Rolling Contacts with Condition Monitoring” by **R. Hanzal**, **L. Wang** and **R.J.K. Wood** (University of Southampton, UK).

11:00 – 12:20 *SESSION XXX - Room Corto Maltese*

Chairman: G. Morales

MULTISCALE MODELLING 3

NON CONTINUOUS MODELLING IN TRIBOLOGY 2

- “Change of surface roughness at the atomic scale due to loading and friction” by **P. Spijker**, **G. Anciaux**, **J.-F. Molinari**, (EPFL, LSMS, Lausanne, Switzerland).
- “A post-processing tool for mapping molecular dynamics to Continuum” by **S. Eder** (Austrian Center of Competence for Tribology Wiener Neustadt, Austria), **A. Vernes** (Austrian Center of Competence for Tribology Wiener Neustadt, Austria & Vienna University of Technology, Austria), **G. Vorlauffer** (Austrian Center of Competence for Tribology Wiener Neustadt, Austria) and **G. Betz** (Vienna University of Technology, Austria).
- “Multi-scale treatment of transient effects in dry friction” by **A. Goedecke** (Johannes Kepler University, Linz Austria & Siemens Corporate Technology, München Germany), **R. Mock** (Siemens Corporate Technology, München, Germany).
- “Friction phenomena of dry rough surfaces – Modelling and Simulation” by **N. Gaus**, **C. Proppe** (Karlsruhe Institute of Technology, Karlsruhe, Germany).

12:20 – 12:40 *CLOSURE/AWARD ATTRIBUTION - Amphi Lespinasse*