

# 4<sup>th</sup> Tribocorrosion Symposium @ Glasgow

9-11th April 2014

University of Strathclyde

Glasgow, UK



**Tribo-corrosion** is a major material issue in many environments, which can lead to significant loss of energy efficiency. It is of increasing interest in not only oil, gas and the nuclear industries, but in the bio-medical, dental, tidal, wind and wave energy domains. This 4<sup>th</sup> International conference will focus on Tribo-Corrosion: Fundamentals to Technology Transfer and Impact. This is the first time that the conference will have been hosted in the UK. The other conferences have been held in India (2006), Austria (2009) and Atlanta (2012).

Scientific topics include the tribocorrosion of coatings and thin films, sliding-corrosion, fretting-corrosion, micro-abrasion-corrosion, tribocorrosion-models, bio-tribo-corrosion (dentistry and orthopaedics), nano-corrosion, surface modifications (nanotube and texturing) to improve tribocorrosion resistance for the biomedical and industrial applications. *Journal of Bio and Tribo-Corrosion*, our first journal for the subject, will be launched at the meeting by Springer (New York) marking a new chapter for our community since the 1st International Conference in Hyderabad in 2006.



## Registration:

Registration Fee: £325 - Full Delegate, £300 - Presenting Author. A discount rate is available for students and retired persons: £75. For further information please refer to the event website: <https://sites.google.com/site/glasgowtc2014/>.

Enquiries: [tribocorrosion2014@gmail.com](mailto:tribocorrosion2014@gmail.com).

## Recommended accommodation:

### The Millennium Hotel, Glasgow

A short walk from the University of Strathclyde, offering a special delegate rate for attendees (£89 B&B).  
E-mail: [reservations.glasgow@millenniumhotels.com](mailto:reservations.glasgow@millenniumhotels.com)  
Tel: +44 141 332 6711



## Organising Committee:



Prof Margaret Stack  
University of Strathclyde  
(Chair)



Dr Mathew Mathew  
Rush Medical  
University, Chicago  
(Co-Chair)



Dr Jean Geringer  
École des Mines de  
Saint-Etienne, France  
(Co-Chair)

## Keynote Speakers:



Prof Jeremy Gilbert  
University of Syracuse,  
New York, USA



Dr Stefano Mischler  
École Polytechnique  
Fédérale de Lausanne,  
Switzerland



Prof Anna Igual Munoz  
Universidad Politécnica  
de Valencia, Spain



Prof Luis Rocha  
São Paulo State  
University, Brazil



Dr Kathy Wahl  
Naval Research Lab.  
Washington, USA



Prof Robert J.K. Wood  
University of  
Southampton, UK



Cameron Johnstone  
University of Strathclyde  
UK

## Event Programme:

### Wednesday - 9th April 2014

Civic Reception and Welcome

City Chambers, Glasgow, 7.00-8.00 PM



### Thursday - 10th April 2014 – Tribo-Corrosion in Bio-Implants

McCance Building, Room 301, 16 Richmond St., G1 1XQ, University of Strathclyde.

08:30 AM – Registration

09:00 AM – Keynote 1: **The body and the metal implant: mechanically assisted corrosion and biological interactions in Ti and CoCrMo alloys**, Prof Jeremy Gilbert, University of Syracuse, New York, USA.

09:40 AM – Keynote 2: **A tribocorrosion assessment of biomedical implants degradation**, Dr. Stefano. Mischler, École Polytechnique Fédérale de Lausanne, Switzerland.

10:20 AM – Coffee break

10:40 AM – Keynote 3: **New insights into tribocorrosion modelling and testing**, Prof Anna Igual Munoz, Universidad Politécnica de Valencia, Spain.

11:00 AM – Coffee break

11:20 AM – **Tribocorrosion methodologies to access the biological outcome in hip implant materials**, Maria Runa, University de Minho, Portugal / TO5.

11:35 AM – **The role of proteins under fretting corrosion tests of metals dedicated to hip prosthesis**, Aleksandra Towarek, École des Mines, St Etienne, France / TO22.

11:50 AM – **Corrosion and tribocorrosion behaviour of hot-pressed CoCrMo/Al<sub>2</sub>O<sub>3</sub> composites for acetabular cup applications**, Fatih Toptan, University de Minho, Portugal / TO10.

12:05 AM – **Corrosion and tribocorrosion behaviour of hot-pressed CoCrMo-HAP biocomposites**, Fatih Toptan, University de Minho, Portugal / TO9.

12:20 PM – **Cobalt-chromium matrix coatings for the corrosion-wear protection of biomedical stainless steel**, Simon Farrugia, University of Southampton, UK / TO2.

12:35 PM – Lunch break

01:30 PM – Keynote 4: **Tribocorrosion and its interactions with the biological system**, Prof Luis Rocha, São Paulo State University, Brazil.

02:20 PM – **Importance of tribocorrosion in temporomandibular joint (TMJ) devices**, Luis Mercuri, Loyola University Medical Center, Illinois, USA / TO30.

02:40 PM – **Effect of pH on corrosion and tribocorrosion behaviour of Ti13Nb13Zr alloy for dental implant applications**, Iona Golvano, Universidad de Mondragon, Spain / TO17.

02:55 PM – **Wear modelling of implant materials for metal-on-metal hip joints in simulated body fluids**, Shoufan Cao, École Polytechnique Fédérale de Lausanne, Switzerland / TO24.

03:10 PM – Coffee break

03:30 PM – **Fretting-corrosion behaviour of mixed-metal contacts in modular junctions of hip implants**, Dmitry Royhman, Rush Medical Center, Chicago, USA / TO27.

03:45 PM – **Study of the galvanic coupling effects of Ti6Al4V in artificial saliva during tribocorrosion at OCP using a new experimental technique**, Anna Igual Munoz, Universidad Politécnica de Valencia, Spain / TO18.

04:00 PM – **Influence of nicotine on the tribocorrosion behaviour of Ti-6Al-4V alloy in artificial saliva**, Dmitry Royhman, Rush Medical Center, Chicago / TO29.

04:15 PM – **Tribocorrosion behaviour of duplex S/CrN and S/CrC Coatings on CoCr Alloy in 0.89% NaCl solution**, Peter Dearnley, University of Southampton / TO26.

04:30 PM – **Nanotribological properties of biocompatible polyzwitterionic brushes**, Zhenyu Zhang, University of Strathclyde / TO28.

4:45- 6.00 PM - **Poster session/reception: McCance Conservatory – Best poster competition.**

### Thursday - 10th April 2014

Conference Dinner: The Corinthian

191 Ingram Street, Merchant City

Glasgow City Centre, 7:00 PM



### Friday - 11th April 2014 – Morning: Tribo-films and Tribo-corrosion in mining environments

McCance Building, Room 301, 16 Richmond St., G1 1XQ, University of Strathclyde

09:00 AM – Keynote 5: **In situ chemistry and mechanics of barnacle adhesive formation and curing**, Dr Kathy Wahl, Naval Research Laboratory, Washington, USA.

09:40 AM – **Tribocorrosion of WC-12Co and WC-12Co(60NiCr) composite coatings on stainless steel in synthetic mine water**, Peter Olubambi, Tshwane University of Technology Pretoria, South Africa / TO20.

09:55 AM – **Influence of microstructure and chemical composition of C-steels on their tribo-corrosive performance**, Ewald Badisch, ac2t, Wiener Neusdat, Austria / TO7.

10:10 AM – **High temperature oxidation-sulphidation behaviour and abrasive wear resistance of NiCrAlY Coating deposited by Oxyfuelthermal spray**, Kudamaa Habib, Universitat Jaume de Castelló, Spain / TO14.

10:25 AM – **On the sulphuric acid corrosion in large 2-stroke marine diesel engines**, Svend Eskildsen, MAN Diesel& Turbo, Copenhagen, Denmark / TO19.

10:40 AM – **Investigation of abrasion-corrosion synergism with a Miller tester**, Jiaren Jiang, National Research Council, Vancouver, Canada / TO1.

10:55 AM – Coffee break

11:20 AM – **Comparison of two-body and three-body tribocorrosion of passivating alloys: effects of contact area and time**, Mobin Salasi, Curtin University, Perth, Australia / TO11.

11:35 AM – **Cavitation erosion-corrosion of ship propeller materials**, Jahnabi Basumatary, University of Southampton / TO8.

11:50 AM – **Predicting abrasion-corrosion behaviour of multiphase WC/Ni claddings**, Grazyna Stachowiak, Curtin University, Perth, Australia / TO12.

12:05 PM – **Particle erosion modelling using Lagrangian approaches**, Shehab Abdelrahman, Univerity of Zagazig and MTC Cairo, Egypt / TO29.

12:20 PM – **Nanoindentation response of deformed polymeric surfaces**, Tanveer Iqbal, University of Engineering and Technology, Lahore, Pakistan / TO3.

12:35 PM – Lunch break

### Afternoon: Marine Renewables – Energy conversion and Tribo-corrosion

01:20 PM – Keynote 6: **Repassivation effects in marine tribocorrosion**, Prof. Robert J.K. Wood, University of Southampton, UK.

02:00 PM – **Effect of normal load on multi-degradation mechanisms of super duplex stainless steel exposed to tribocorrosive-fatigue environment**, Amin Zavieh, Norwegian University of Science and Technology (NTNU), Trondheim, Norway.

02:15 PM – **Sliding tribocorrosion behaviour of bulk metallic glass against steel in 3.5% NaCl solution**, Xiulin Ji, Hohai University, Changzhou, China / TO16.

02:30 PM – Keynote 7: **Tribology issues in Tidal Turbines**, Cameron Johnstone, University of Strathclyde, UK.

03:10 PM – **A case of tribocorrosion failure in Fe-Cu-C brake pads exposed to humid atmospheric conditions**, Alexandre Mège-Revil, Laboratoire de Mécanique de Lille, Villeneuve d'Ascq, Université de Lille, France / TO4.

03:25 PM – **Comparison of the tribo-corrosion performance of ZrN and TiAlN thin coatings**, Manuel Rodriguez-Ripoll, ac2t, Austria / TO6.

03:40 PM – **Final session / Award for best poster. Synthesis + Discussion with the audience: Towards 2016 and beyond?** Prof Stack, Dr Mathew and Dr Geringer.

03:55 PM – **Coffee break and networking – End of Tribocorrosion 2014.**