



Conference Programme

University of Southampton

19th-20th June 2024





Dear all,

Welcome to the 19th TriboUK conference at the University of Southampton.

Every year, TriboUK has been a platform for researchers to share their work and connect with like-minded individuals within the Tribology community. It has been a gateway to building relationships and expanding networks.

TriboUK 2024 will showcase a blend of oral and poster presentations from students, post-doctoral researchers and keynote speakers – featuring experts from industry and academia. There will be an expert panel session designed to discuss key topics of interest within the Tribology community. Attendees should look forward to networking opportunities as well as a drinks reception and conference dinner. It promises to be an enriching and interactive event.

On behalf of the conference organizing committee, we'd like to extend our heartfelt gratitude to the Tribology community for the incredible enthusiasm and support leading up to this event. Your excitement and engagement truly make all the difference, and we're looking forward to a successful and memorable TriboUK 2024 conference together!

Our best wishes,

TriboUK 2024 Committee

(Mostafa, Yousif, Lijia, Daniel, Jia and Thomas)



Welcome to Southampton

Southampton is a major UK port city here on the south coast of England and it is packed with history, heritage, and beautiful surrounding scenery:

The SeaCity Museum (& the Titanic)



Discover the story of RMS Titanic and how the tragedy affected the city and people of Southampton. Featuring an interactive model of the Titanic, recorded messages of its passengers of the fateful night, original objects from on board the world-famous ship and more.

Solent Sky Museum



Come and see the home of the Spitfire and the largest flying boat operation in the world - 20 aircraft are on display from the golden age of aviation as well as the Hampshire Police and Fire Museum.

The New Forest National Park



Fall in love with the New Forest's breathtaking wildlife and nature. Each season provides a change of scene from the wonderful bright colours of spring and summer to the kaleidoscope of warm hues in autumn and sheets of white frost in the winter.

Ocean Village Marina



Ocean Village Marina is nestled in the heart of Southampton and sits on the mouth of the river Itchen. It is the UK's first and only 5* marina. The waterfront is a lively and refined area with shops, bars and restaurants, which is as much a part of the boating experience as sailing.



Wednesday 19th June – Day 1

8:45 – 9:30	Registration
9:30 – 9:45	Welcome to TriboUK 2024
9:45 – 10:30	Keynote - Dr. Doris Khaemba
10:30 – 11:30	Presentation session #1
11:30 – 12:00	Coffee break
12:00 – 12:45	Keynote - Prof. Daniele Dini
12:45 – 14:00	Lunch
14:00 – 14:45	Presentation session #2
14:45 – 14:55	iMechE Talk – Honor Powrie
15:00 – 16:00	Poster Session
16:00 – 17:00	Panel Discussion
19:00 –	Conference drinks and dinner:

**Leonardo Royal Hotel Southampton Grand
Harbour- W Quay Rd, Southampton SO15 1AG**



Thursday 20th June – Day 2

9:00 – 9:30	Morning coffee & refreshments
9:30 – 10:15	Keynote – Dr. Gordon Lamb
10:15 – 10:30	STLE UK Student Chapter Talk
10:30 – 11:00	Coffee break
11:00 – 12:00	Presentation session #3
12:00 – 13:00	Lunch
13:00 – 13:45	Keynote - Prof. Mark Rainforth
13:45 – 15:05	Presentation session #4
15:05 – 15:10	IOP Talk
15:10 – 15:30	Break
15:30 – 16:15	Awards and closing ceremony



The Keynote Speakers



Prof. Daniele Dini

Imperial College

Professor Dini is Head of the Imperial College Tribology Group, one of the largest tribology groups in the world. He leads the advanced modelling research within the Tribology Group his passion for research and mentoring has been recognised at Imperial College by a Medal in Research Supervision (2012) and two other Teaching awards. Professor Dini's research centres on the application of advanced modelling strategies to applied mechanics, materials, physics, chemistry, biomechanics and structural integrity, with a particular focus on tribology.

Dr. Doris Khaemba

JCB

Doris Khaemba is a Senior Engineer at JCB responsible for engine oils and coolants for JCB machines. She holds a bachelor's degree in chemical engineering from Tokyo University of Agriculture and Technology and a Masters degree in the same field from Loughborough University. She received her PhD from the University of Leeds with research focused on engine oil formations for passenger vehicles.



Prof. Mark Rainforth

University of Sheffield

After obtaining a 1st Class Honours degree from the University of Sheffield, Mark Rainforth initially followed an industrial career. He later joined the Department from the University of Leeds in 1989 and rapidly established state-of-the-art facilities in electron microscopy and tribology. He is co-author of the book Ceramic Microstructures with W E Lee, a winner of the Rosenhain Medal of the IoM³ and has recently finished his term as President of the Royal Microscopical Society. Professor Rainforth's research centres on the high-resolution characterisation of microstructures, in particular interfaces and surfaces.

Dr. Gordon Lamb

Castrol

Gordon Lamb is a senior advisor in formulations and advanced lubricant products at Castrol. Dr. Lamb has previously given captivating talks at the BP Castrol-RSC International Symposium on Tribology and Lubricants in China as well as the Commercial Vehicle Megatrends meeting in Chennai, India. We are excited to welcome an industry leader in his field to TriboUK 2024.



Panel Members

Panel Discussion Chair:

Prof. Julian Wharton

Professor at University of Southampton and Head of National Centre for Advanced Tribology at Southampton (nCATS)

Panellists:

Prof. Honor Powrie

GE Aerospace & Visiting Professor University of Southampton

Dr. Marc Masen

Reader in Tribology and Mechanical Engineering Design at Imperial College London

Dr. Pourya Parsaeian

Senior Technologist and Project Manager at Castrol

Dr. Richard Cook

Associate Professor at University of Southampton

Mr. George Plint

Director at Phoenix Tribology Ltd

Dr Timothy Kamps

Senior scientist at National Physical Laboratory (NPL)

Send your questions anonymously to the panel using this QR code!



Oral Presenters

Presentation Session #1

Daniel Powers Experimental Investigations into Electrical Discharges Through Rolling Contacts
University of Southampton

Matteo Valderrama Beyond Graphene: Computational Screening of 2D Materials to Eliminate Friction
Imperial College London

Luli Li FE modelling for Stent-artery interaction considering the surface topography of stent
Imperial College London

Presentation Session #2

Oliver Prendergast Adjusting the Electrode Configuration to Maximise Power Output of Water Triboelectric Nanogenerators
Imperial College London

Thomas Dyke The Tribology of Tooth Brushing Using Spherical Silica
University of Southampton

Yilong Li Characterising the Role of Friction in Wrinkle Formation during Multiply Double Diaphragm Forming Process for Non-Crimp Fabric Materials
University of Cambridge





Presentation Session #3

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| Mostafa Ellaithy
University of Southampton | Mechanistic Study of White Etching Area Development in Butterflies Through 3D Investigations of Roller Bearings |
| Zhaoran Zhu
Imperial College London | Probing the Effect of Electric Fields on Behaviours of Lubricant Additives Confined between Surfaces at Molecular Level |
| Filimonas Kaliafetis
Imperial College London | Digital Twins of Lubricated Systems and Their Evolution – Digital Mini Traction Machine |
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Presentation Session #4

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| Ajay Lodhi
University of Leeds | Efficiency improvements of in-situ hydrogen permeation measurements in lubricated bearing steel contacts using the Modified Devanathan-Stachurski Cell (MDSC) method. |
| Debashis Puhan
Imperial College London | Plant-Based Protein and Oral Lubrication: Investigating the Effects of Pea Protein Isolates on Salivary Films by Analysing the Frictional Response of a PDMS Oral Mimic |
| Zaihao Tian
University of Southampton | Condition Monitoring of Pitting Evolution Using Multiple Sensing |
| Margarida Santos
Imperial College London | Understanding skin ageing through non-invasive means; correlating skin contact mechanics, microstructure and age. |



Posters

Aashish John Bournemouth University	Influence of surface topography modification on surface, mechanical and tribological properties of Ni- Co/ZrO ₂ pulse electrodeposition nanocomposite coating
Daniel Powers University of Southampton	Experimental investigations into electrical discharges through rolling contacts
An Ping University of Sheffield	Experimental study of fretting wear and false brinelling of roller-type wind turbine pitch bearing by small-scaled roller-on-plate contact configuration
Beikang Liu Imperial College London	Acoustic Emission and Frictional Analysis of Granular Material Systems
Bethan Collins University of Southampton	Mo-S-C Solid Lubricant Coatings
Hao Yao Wong University of Southampton	High Resolution 3D Imaging for Dentine Microtubule Mapping and The Efficacy Testing of Sensitivity Toothpaste Formulations
Lucie Hlubinkova University of Birmingham	Transfer properties of solid fabric enhancer coating
Lijia Yi University of Southampton	A Comprehensive Study of Zn-Ni Alloy Coatings: Microstructural Characterization, and Nanocomposite Coatings
Mengyuan Li University of Sheffield	Feasibility of using non-destructive and radiation-free techniques for measuring tooth degradation
Paul-Anaël Pogu Imperial College London	Oil Aeration: The life cycle of a bubble
Rui Dai University of Sheffield	Effect of Damaged Non-metallic Inclusions on Subsurface Cracking of Wind Turbine Gearbox Bearings
Ziyuan Ren Loughborough University	A review of the state of art in plastic gear technology
Connor Egerton University of Southampton	Correlative Electrical Contact Resistance of duplex stainless steel with nano-indentation
Sunil Poudel University of Exeter	Tribological property of Al-CeO ₂ composites

Our Sponsors and Affiliations



The Foundation was established in 1986 by the late Dr H Peter Jost CBE. Peter coined the term “tribology” (from the Greek word “tribo” – I rub) to describe the science of friction, wear, and lubrication – giving birth to a new engineering discipline.

The Foundation provides financial support to UK tribology academics and researchers who wish to attend tribology and related conferences or participate in other relevant activities. Please see jostfoundation.org/travel-fund for further info.



Castrol was founded by Charles “Cheers” Wakefield under the name of ‘CC Wakefield & Company’. In 1899 Charles left a job at Vacuum Oil to start a new business selling lubricants for trains and heavy machinery. Castrol are now an industry leader in lubrication.



PCS Instruments has been manufacturing world leading tribology equipment for over 30 years and are proud sponsors of TriboUK 2024. We believe deeply in the value of research and find a conference organized specifically to highlight the hard work by PhD students a thoroughly worthwhile endeavor.



Rtec Instruments provides testing solutions for mechanical and optical surface characterization. Our innovative solutions cover tribology, scratch testing, adhesion, hardness and surface inspection to provide leading testing instruments.



For well over a century, Shell has been playing a major role in powering and fuelling the UK's industry, transport and homes. Shell UK remains one of the North Sea's biggest producers, supplying around 10% of the UK's total oil and gas needs. In the years ahead, as the UK looks to strengthen energy security and deliver its 2050 net-zero goal, Shell UK aims to play a crucial role. We aim to be a major investor in the UK energy system by helping our customers decarbonise with a focus on transport and industry.



The Institute of Physics (IOP) is the professional body and learned society for physics in the UK and Ireland, with an active role in promoting co-operation in physics around the world. We strive to make physics accessible to people from all backgrounds.



The Institution of Mechanical Engineers provides life-long learning opportunities for our 115, 000 members, many of whom will achieve professionally registered status. We provide the opportunity to meet, exchange ideas and innovate.



TribNet is a web-based project devoted to the research and technology development in the field of Tribology & Lubrication. TribNet publishes high quality popular science articles, covering the most interesting news and developments in the field.



We are connecting students and those in an early-stage career with established industrial bodies and academics. Our aim is to increase the awareness of ongoing research and promote careers in the field. Find out more on our social media and at <https://stleukstudents.org>.



We are a multidisciplinary tribology centre. We research next generation tribological design issues and enable surface interactions to occur with minimal energy loss and impact on the environment. We focus on solutions to real-life engineering problems, including the challenge of efficient renewable energy systems.



Our world-class teaching and research activities are delivered across 5 faculties, each of which hosts several subject-specific schools and departments. We inspire excellence to achieve the remarkable and build an inclusive world. Our people are our university; they are at the heart of everything we do and the impact we make on a local to global scale.



CN Tech provide sales, support, service, repair, and lab supplies solutions across a diverse product range. We specialize in Stylus/Optical and Stress Measurement, AFM Systems, Probes and Accessories, Asher/Plasma Cleaners, SEM Indenters, Miniature Tensile Testers, Thickness Testers, Temperature/Humidity Control, Vibration/Acoustic Solutions and Faraday Cages.



Conference Venue

Campus Map:

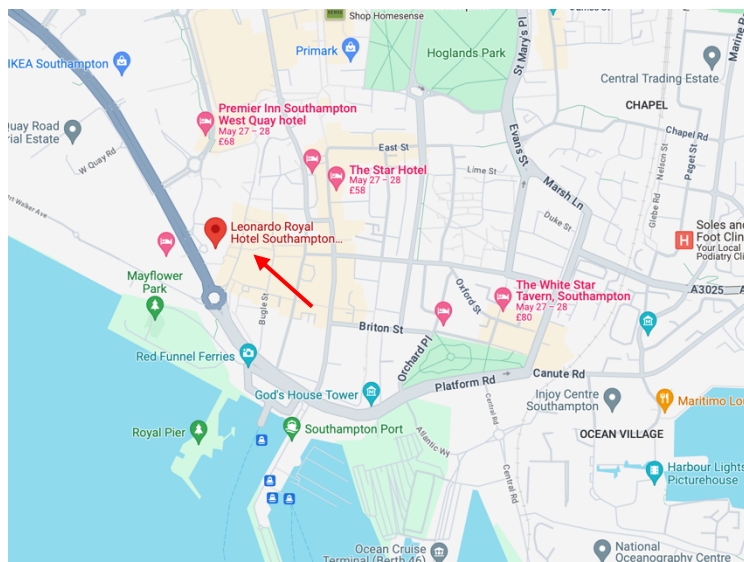


The Centenary Building
University of Southampton,
University Rd, Southampton
SO17 1BJ

Conference Drinks and Dinner Venue



Leonardo Royal Hotel Southampton
Grand Harbour
W Quay Rd, Southampton SO15 1AG



For any questions, please email us at: Tribouk2024@soton.ac.uk