



15th INTERNATIONAL CONFERENCE ON TRIBOLOGY



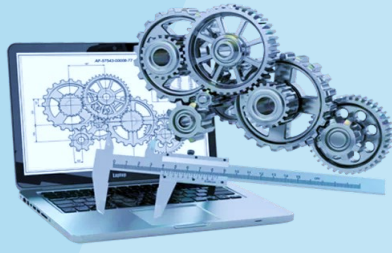
'24
ROTRIB

Reconfigure Tribology for the Future!

APRIL 18-20, 2024

**POLITEHNICA Bucharest
Conference Center**





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Mihnea COSTOIU – Rector, POLITEHNICA Bucharest

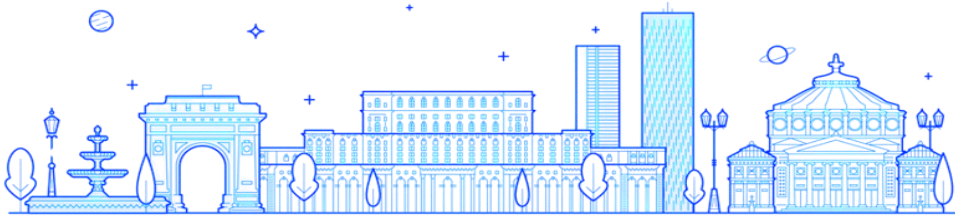
Solving industry challenges

*One of the fundamental values we cultivate at **Politehnica Bucharest** is the pursuit of innovation that can have positive impacts throughout the industry. It is our long-standing commitment to advancing knowledge and fostering collaboration in fields critical to the future of science, technology, and engineering. And in the context of large-scale implementation of robotics in mass-production, or innovation in the field of materials, **ROTRIB'24** stands as a testament to our dedication to contribute to the improvement of this sector and beyond.*

*As in the past decade we have aimed to become a cooperation platform for international experts and academia, the number of participants to this edition of **ROTRIB** reflects not only the global significance of this event, but also the dedication of professionals all over the world to contribute to the advancement of this field. For this, I would like to take a moment and thank all participants for their dedication and openness to innovate and cooperate beyond borders.*

*I extend a warm welcome to all participants of **ROTRIB'24**. Our community is proud to be a part of this crucial conversation, and I am confident that the collaborations fostered here will lead to groundbreaking advancements in tribology for years to come. Moreover, I would like to thank the speakers, as well as Prof. Minodora Rîpă, the Chair of the Organising Committee and Prof. Traian Cicone, the Chair of the Conference, for making this event possible.*

*I hope this event serves as a platform for continued exploration and discovery in tribology. Together, let's expand the boundaries of this field and help solve the challenges of the industry. On behalf of the **Politehnica Bucharest** community, I wish you all a successful and productive **ROTRIB'24**.*



ROTRIB '24

Reconfigure Tribology for the Future!

ROTRIB'24 is the 15th in a series of international scientific events on TRIBOLOGY organised in Romania since 1978. The conference aims to provide an interdisciplinary forum for discussion, networking and initiating collaborations among specialists, about materials and Tribology and their applications to product design and reliability.

The theme of this year's conference, *"Reconfigure Tribology for the Future"* underlines the importance of tribology in addressing the challenges and innovations in our evolving world.

After over 50 years of existence, since Peter Jost first coined the term, Tribology needs to reconfigure its directions to meet

the latest developments in science and technology, and we hope that our conference will be an excellent opportunity to accomplish this.

Between **April 18-20, 2024** ROTRIB'24 will offer you the opportunity to explore many topics related to tribological research, such as Lubrication, Contact Mechanics, Biotribology, Surface Engineering, Multi-physics Modelling, Tribochemistry, and many more. This year's edition gathers over 100 participants from 17 countries from all across the globe. We encourage the participants to engage in stimulating discussions, and foster collaborations with like-minded individuals!

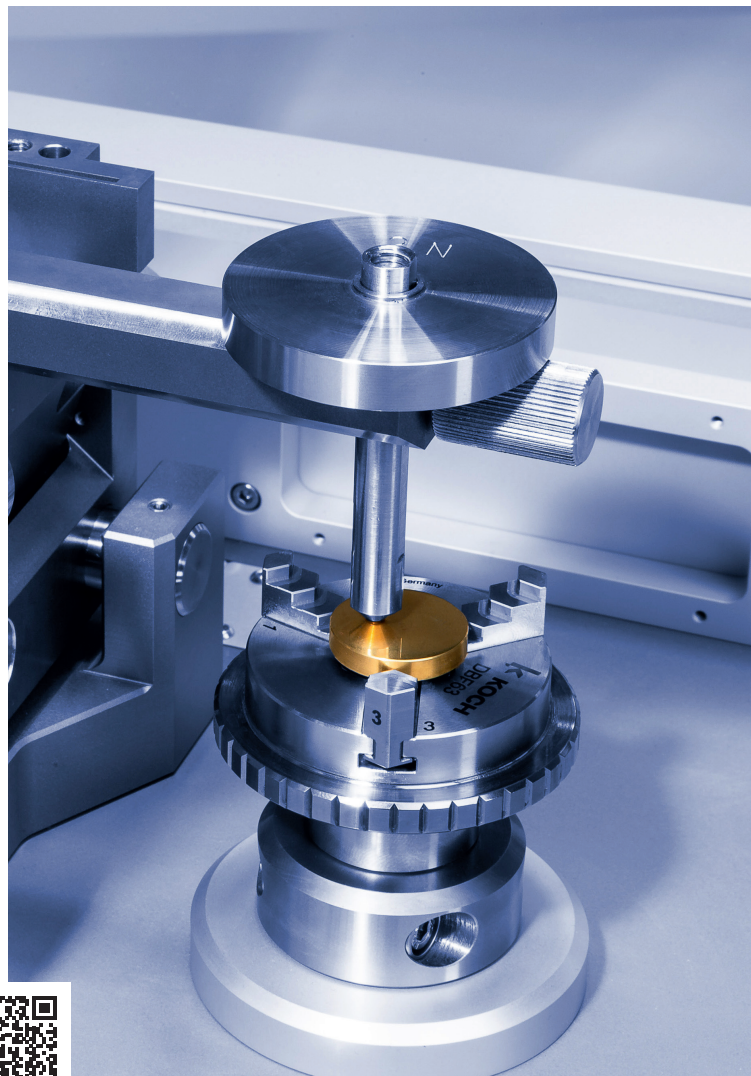


Traian CICONE
Chair of the Conference



Minodora RÎPĂ
Chair of the Organizing Committee





Versatile Tribological Analysis: **Face Your Surface**

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TRB³

Solid-solid contact with or without lubricant

Friction, wear, and lubrication properties

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Different temperatures, humidity or vacuum levels

Keynote speakers

Unlocking Insights, Inspiring Minds



**Mircea D.
PASCOVICI**

*Emeritus Professor, POLITEHNICA
Bucharest*

*Analytical models in Lubrication. A
life experience*



Dae-Eun KIM

Professor, Yonsei University

*Fundamental Understanding of
Friction at the Sliding Interface*



Daniel NELIAS

Professor, INSA Lyon

*Rolling Contact Fatigue of Dented
Surfaces*



Mihai ARGHIR

Professor, University of Poitiers

*The Role of Bulk Flow Model and CFD
Analyzes in Today's Lubrication*

We invite you to attend **four captivating lectures** on four different tribological topics.

This year's edition has as distinguished guest speakers: Professor Mircea D. Pascovici from Romania, Professor Dae-Eun Kim from South Korea, Professor Daniel Nelias, and Professor Mihai Arghir, from France.

Through their lectures, we shall dive into the history of problem-solving, transitioning from analytical to numerical modelling, and explore the effects of friction and fatigue, in sliding and rolling conditions, respectively.

We guarantee these lectures will **inspire** and **enlighten** you, whether you are a researcher in the field, a specialist with industrial experience or a mere tribology enthusiast!

COMMITTEES

Chair: Traian CICONE

Vice-chair: Viorel PALEU, Marius PUSTAN

Honorary Committee:

Napoleon Niculae ANTONESCU - *Romania*

Emilia ASSENOVA - *Bulgaria*

Spiridon CREȚU - *Romania*

Michel FILLON - *France*

Dumitru OLARU - *Romania*

Mircea D. PASCOVICI - *Romania*

Dumitru POP - *Romania*

Andrei TUDOR - *Romania*

Scientific Committee:

Andreas ALMQVIST - *Sweden*

Mihai ARGHIR - *France*

Shubrajit BHAUMIK - *India*

Corina BÎRLEANU - *Romania*

Benyebka BOU-SAID - *France*

Jean BOUYER - *France*

Noel BRUNETIERE - *France*

Mihaela BUCIUMEANU - *Romania*

Carmen BUJOREANU - *Romania*

Óscar CARVALHO - *Portugal*

Lorena DELEANU - *Romania*

Valeriu DULGHERU - *Republic of Moldova*

Nuria ESPALLARGAS - *Norway*

Izhak ETSION - *Israel*

Aurelian FATU - *France*

Romeo GLOVNEA - *United Kingdom*

Irina HUSSAINOVA - *Estonia*

Juliana JAVOROVA - *Bulgaria*

Dae-Eun KIM - *South Korea*

Wojciech LITWIN - *Poland*

Athanassios MIHAILIDIS - *Greece*

Ilie MUSCĂ - *Romania*

Daniel NELIAS - *France*

Gencaga PURCEK - *Turkey*

Alexandru Valentin RĂDULESCU - *Romania*

Răzvan George RÎPEANU - *Romania*

Alessandro RUGGIERO - *Italy*

Adolfo SENATORE - *Italy*

Tianmin SHAO - *China*

Petr SVOBODA - *Czech Republic*

Aleksandar VENCL - *Serbia*

Michal WODTKE - *Poland*

Chair of the Organizing Committee: Minodora RÎPĂ

Organizing Committee:

Andrei CĂLIN

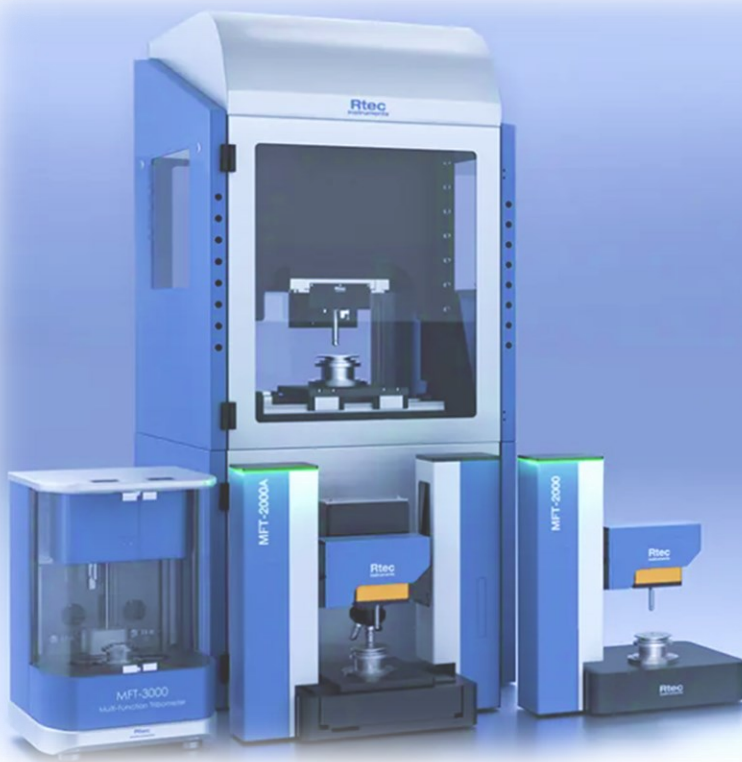
Alice MARINESCU

Ionuț - Răzvan NECHITA

Georgiana Ionela PĂDURARU

Petrică TURTOI

Leading innovation in surface and materials testing instrumentation



*With technical excellence, unwavering customer support and new application development assistance, we lead several new technological fronts in **tribology, indentation, scratch & fretting.***



Conference Venue

Nestled within the prestigious **National University of Science and Technology POLITEHNICA Bucharest** (formerly University POLITEHNICA of Bucharest), a technical institution with over 25.000 students and a rich history spanning two centuries since its origins in 1818, our conference venue boasts state-of-the-art facilities.



The modern **Conference Center**, situated within the heart of the university's vibrant campus, provides an ideal backdrop for intellectual exchange.





With **plenty of access to public transportation** in its close proximity, navigating the city is effortless, making the university campus the perfect host for a productive and accessible conference experience.


Address:

Conference Center
POLITEHNICA Bucharest,
Splaiul Independenței 313,
Bucharest 060042,
ROMANIA

Access to Public Transport

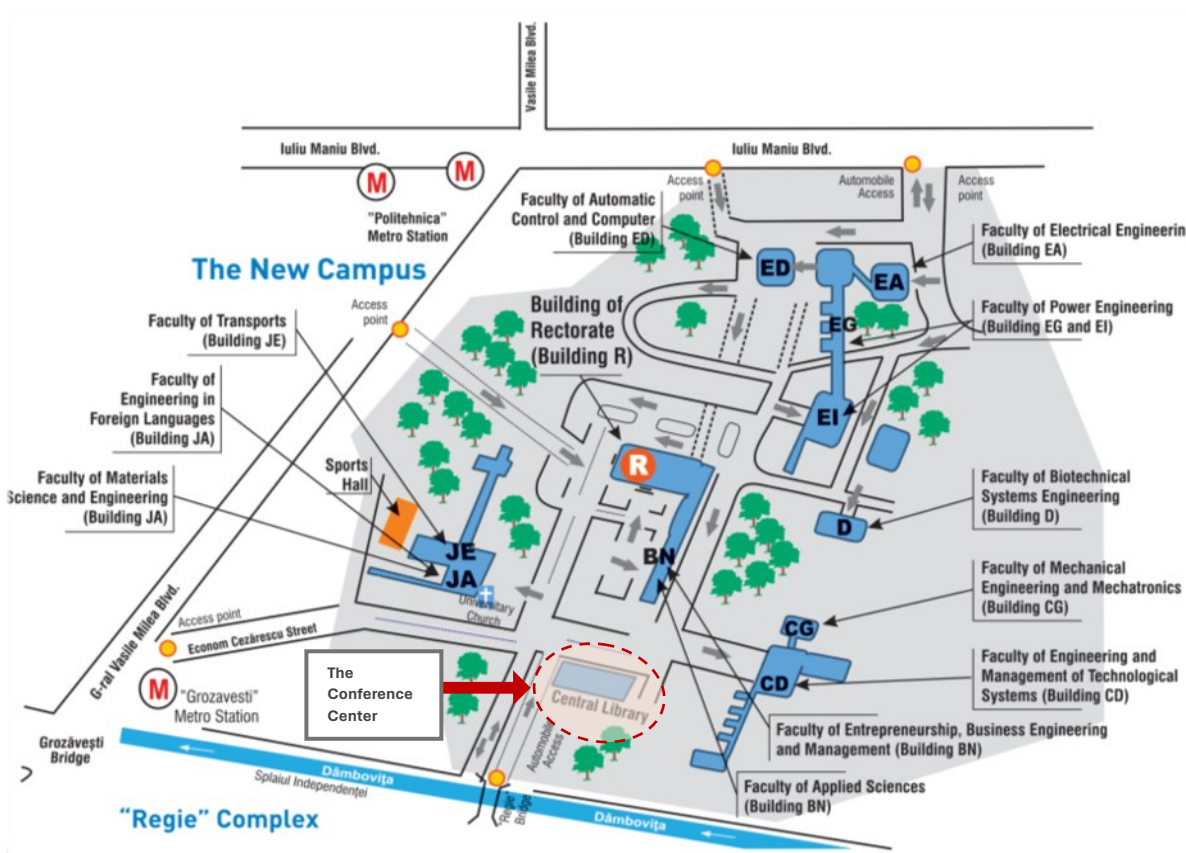
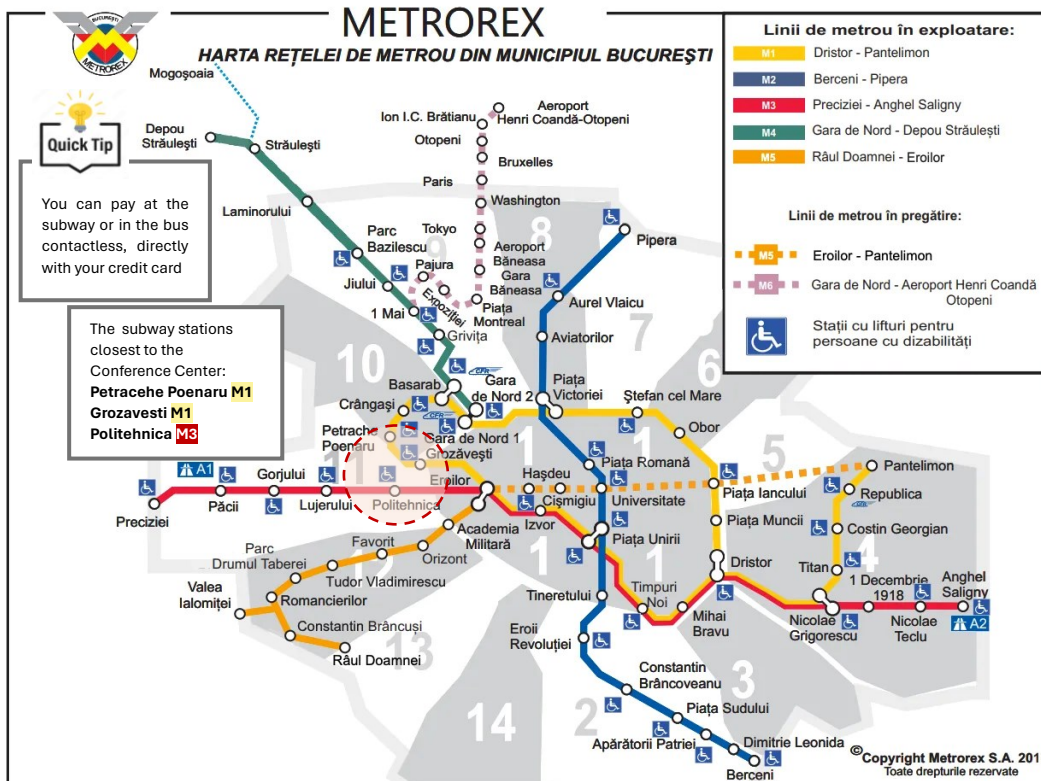
 **Bus: 105, 136, 139**

 **Tram: 1, 10**

 **Subway: M1, M3**



Practical Information



Program at a glance

WEDNESDAY April, 17	Welcome Cocktail Registration 17:00 - 19:00		
THURSDAY April, 18		FRIDAY April, 19	
Registration 8:00-9:30			
Opening Ceremony <i>ROOM 2-1</i> 9:30 - 10:00			
KEYNOTE SPEAKERS 10:00-11:00			
Coffee break 11:00-11:15			
KEYNOTE SPEAKERS 11:15-12:15	Session 3-A <i>ROOM 2-2</i> 9:00-10:40	Session 3-B <i>ROOM 2-3</i> 9:00-10:40	
Sponsors session 12:15-13:15	Friction & Wear 2	Bio-Tribology	
LUNCH BREAK 13:15 - 14:30	Coffee break 10:40-11:00	Coffee break 10:40-11:00	
Session 1-A <i>ROOM 2-2</i> 14:30-16:10	Session 4-C <i>ROOM 2-1</i> 11:00-13:00	Session 4-A <i>ROOM 2-2</i> 11:00-13:00	Session 4-B <i>ROOM 2-3</i> 11:00-13:00
Friction & Wear 1	Tribology in Machine Elements	Surface engineering & coatings	Lubrication 2
Session 1-B <i>ROOM 2-3</i> 14:30-16:10	LUNCH BREAK 13:00 - 14:15		
Lubrication 1	Session 5-A <i>ROOM 2-2</i> 14:15-16:15	Session 5-B <i>ROOM 2-3</i> 14:15-16:15	
Coffee break 16:10-16:30	Friction & Wear 3	Lubricants & Tribo-chemistry 2	
Session 2-A <i>ROOM 2-2</i> 16:30-17:50	Coffee break 16:15-16:30		
Contact Mechanics	CONFERENCE CLOSURE		
Session 2-B <i>ROOM 2-3</i> 16:30-17:50			
Lubricants & Tribo-chemistry 1			
GALA DINNER 19:00-23:00			
SATURDAY April, 20	Conference Trip 7:45 - 19:00		

Program THURSDAY, April 18th

10:00-10:30	KEYNOTE SPEAKER Mircea D. PASCOVICI (ROMANIA) Analytical models in Lubrication. A life experience
10:30-11:00	KEYNOTE SPEAKER Dae-Eun KIM (SOUTH KOREA) Fundamental Understanding of Friction at the Sliding Interface
11:00-11:15	Coffee break
11:15-11:45	KEYNOTE SPEAKER Mihai ARGHIR (FRANCE) The Role of Bulk Flow Model and CFD Analyzes in Today's Lubrication
11:45-12:15	KEYNOTE SPEAKER Daniel NELIAS (FRANCE) Rolling Contact Fatigue of Dented Surfaces
12:15-13:15	Sponsors Session Anton Paar, Rtec Instruments, Etanșări Grafex, Mobil Industrial AG
13:15-14:30	LUNCH BREAK

Session 1-A: *Friction & Wear 1*

Room: 2.2

Co-Chairs: **Gabriela Cristina IONESCU** **Răzvan-George RÎPEANU**

<i>Hour</i>	<i>Title and authors</i>
14:30-14:50	The challenge of studying tribological applications on the laboratory scale <i>Emmanuel Georgiou, Angelos Koutsomichalis, Dirk Drees, Jean-Pierre Celis, Nikolaos Vaxevanidis</i>
14:50-15:10	Enhancing Insight into Tribological and Mechanical Properties: Integrating Mechanical Testing, 3D Profilometry, and Electrified Tribology Techniques <i>Gregory Favaro, Philippe Kempe, Vishal Khosla (Rtec-Instruments)</i>
15:10-15:30	Two-body and three-body friction and wear characteristics of dental composites in different mediums <i>Kivanc Dulger, Gencaga Purcek</i>
15:30-15:50	Tribological behavior of 410L SS - SiCp composites reinforced with SiC particles functionalized by Ti-Ni coating layers <i>Oscar Carvalho, Mihaela Buciumeanu, Abdulsalam Muhrat, Filipe Samuel Silva</i>
15:50-16:10	Friction and Wear Behaviour of Fine-Grained and Aged Al 2024 Alloy <i>Gencaga Purcek, Harun Yanar, Muhammet Demirtas, Melih Ustalar, Uzun Muhammet</i>

Session 1-B: *Lubrication 1*

Room: 2.3

Co-Chairs: **Jean BOUYER** **Michal WASILCZUK**

<i>Hour</i>	<i>Title and authors</i>
14:30-14:50	Transient multiscale simulation of the lubricant flow between two rough surfaces. <i>Noel Brunetiere, Arthur Francisco</i>
14:50-15:10	Effect of lubricant properties on the performance of a hydrodynamic journal bearing based on theoretical results. <i>Michal Wodtke, Wojciech Litwin</i>
15:10-15:30	Analysis of multi-recess compliant hydrostatic thrust bearings with misaligned surfaces operating under rotating and non-rotating conditions. <i>Alice Marinescu, Aurelian Fatu, Traian Cicone</i>

15:30-15:50	Performance and resilience of a spring-supported thrust bearing of a hydropower unit. <i>Samuel Cupillard</i>
15:50-16:10	Performance characteristics of a hydrostatic thrust bearing with poro-elastic restrictor. <i>Alin Mărgineanu, Alice Marinescu, Aurelian Fatu, Traian Cicone</i>
16:10-16:30	Coffee break

Session 2-A: *Contact Mechanics*

Room: 2.2

Co-Chairs: Viorel PALEU Daniel NELIAS

<i>Hour</i>	<i>Title and authors</i>
16:30-16:50	Friction at the grain-scale: the role of inter-particle friction in granular media and its effect on grain-and- macro-scale bed behaviour. <i>Jack Moss, Romeo Glovnea</i>
16:50-17:10	Use of constructal law to proof the maximum work principle for both bulk plasticity and contact surface friction. Application to anisotropic tribological behaviour <i>Adinel Gavrus</i>
17:10-17:30	About local and volume deformation of rubber spheres <i>Ilie Muscă, Elena Vărăreanu Sîrghie, Marius Marchitan</i>
17:30-17:50	Fractal modelling of the static friction coefficient in elliptic hertzian wheel-rail contact <i>Laura Mariana Babici, Andrei Tudor, Jordi Romeu</i>

Session 2-B: *Lubricants & Tribochemistry 1*

Room: 2.3

Co-Chairs: Mihaela BUCIUMEANU Gencaga PURCEK

<i>Hour</i>	<i>Title and authors</i>
16:30-16:50	The impact of using lubricants for flanged joints <i>Andreea Pătrașcu (Etanșări Grafex)</i>
16:50-17:10	The superior lubricity demonstrating nanoparticle and protic ionic liquid-based lubricity-improving additives for water-based lubricants <i>Raimondas Kreivaitis, Arturas Kupcinskas, Jolanta Treinyte, Milda Gumbyte</i>
17:10-17:30	Influence of graphite macroparticles on friction and wear of A356/SiC/Gr composites in boundary lubrication conditions <i>Aleksandar Vencl</i>
17:30-17:50	Experimental research on the corrosion resistance characteristics of A606 steel used in the manufacture of coiled tubing <i>Gabriela Cristina Ionescu, Ion Nae, Octavian Narcis Ionescu, Răzvan-George Rîpeanu</i>
19:00-23:00	GALA DINNER

Etanșări Grafex is a Romanian manufacturer and supplier of non-asbestos sealing products for all types of applications, from the most common ones to the nuclear industry. Since 1996 the development of the company has been based on the knowledge and expertise in this specific domain, as well as on the constant will to manufacture customized products according to specifications of each application. Etanșări Grafex is the first company in Romania to be a member of the European Sealing Association.

Expertise

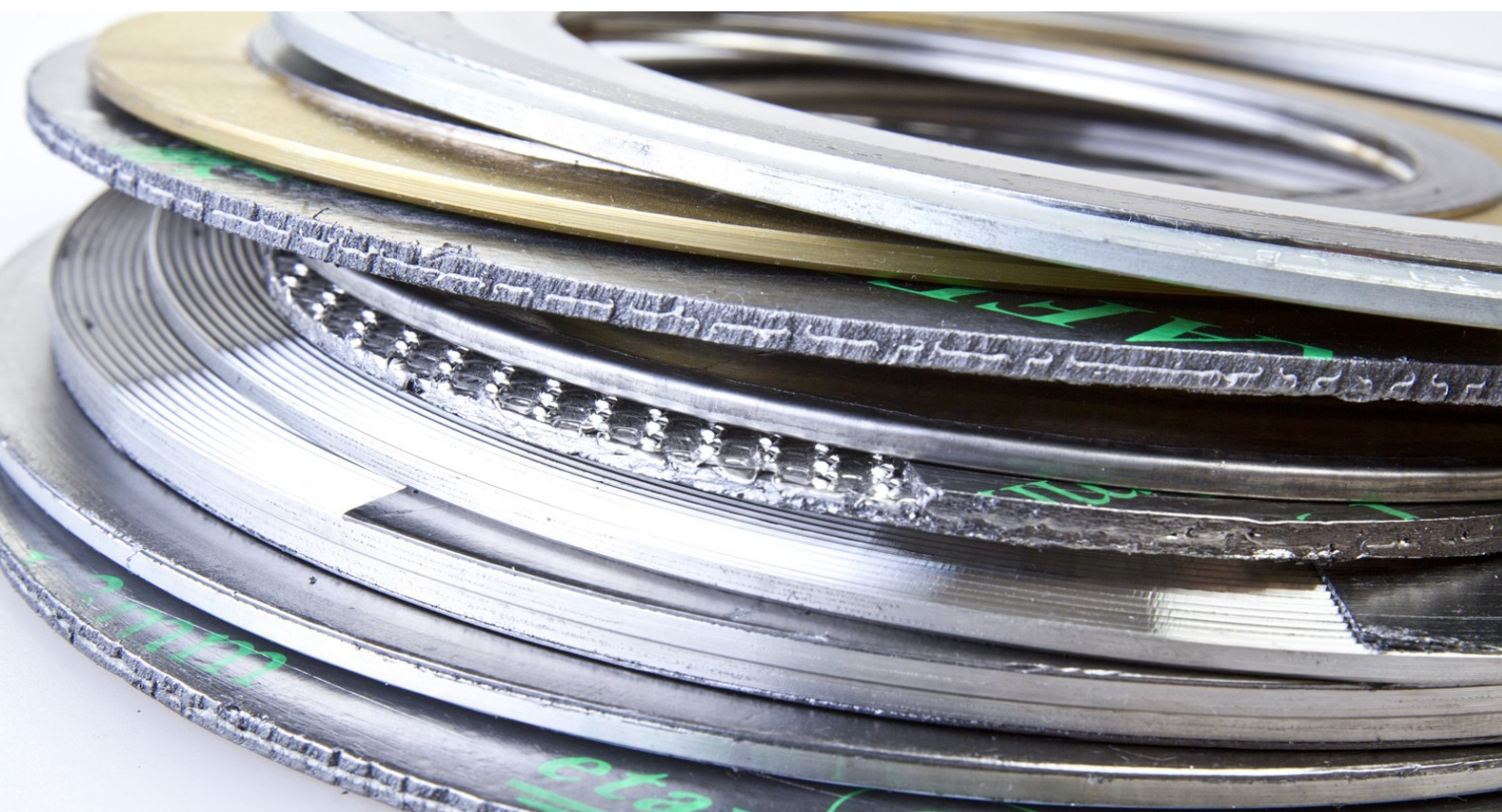
Our expertise goes beyond the products that we manufacture to the equipment that they are used with.

Efficiency

We are efficient in giving you high-quality products and services at the highest level of professionalism.

Solutions adapted to your needs

Grafex experts will deliver you not just the products, but also offer you a complete technical solution adapted to your company's needs.



Program FRIDAY, April 19th

Session 3-A: *Friction & Wear 2*

Room: 2.2

Co-Chairs: *Romeo GLOVNEA Dae-Eun KIM*

Hour	Title and authors
9:00-9:20	Analysis of static and kinetic friction coefficient in the contact between glass and soft materia. <i>Bogdan Chiriac, Dumitru Olaru, Ana Tufescu</i>
9:20-9:40	Comparative evaluation of tribological properties of brake pad materials. <i>George Bălăsoiu, Valentin Amorțilă, Doina Boazu, Mihaela Buciumeanu</i>
9:40-10:00	Impact wear effect on sound absorbing panels. <i>Elena Adelina Chiriac, Marcelin Benchea, Carmen Bujoreanu</i>
10:00-10:20	Clearance optimization for roller-shoe transmission mechanism from diesel high-pressure common rail pumps. <i>Constantin Răzvan Iordache, Carmen Bujoreanu, Dumitru Olaru</i>
10:20-10:40	Experimental determination of the friction coefficient in the dry sliding friction regime with application to brake discs. <i>Ionuț Daniel Geonea, Ilie Dumitru, Laurențiu Răcilă, Gabriel Marinescu</i>

Session 3-B: *Bio-Tribology*

Room: 2.3

Co-Chairs: *Lorena DELEANU Nikolaos VAXEVANIDIS*

Hour	Title and authors
9:00-9:20	Comparative study of the scratching behaviour of the materials used for medical orthoses <i>Marius Costin Poporogu, Georgiana - Ionela Păduraru, Andrei Călin, Petre - Lucian Seiciu, Marilena Stoica</i>
9:20-9:40	Characterization of BioTribological Interfaces - Opportunities and Challenges <i>Kartik Pondicherry, Paul Staudinger, Julius Heinrich (Anton Paar)</i>
9:40-10:00	Nanotribological Characterization of Dental Restorative Materials <i>Marius Pustan, Corina Bîrleanu, Mircea Cioază, Florin Popa</i>
10:00-10:20	Stick-slip behaviour in a human knee <i>Michal Ruzek, Andre Timofeyev, Samuel Saragoussi, Ana-Maria Trunfio-Sfarghiu</i>
10:20-10:40	Insights into the Young's modulus of human finger skin: evaluating contact area and indentation creep behaviour <i>Andrei Călin, Andrei Tudor, Miloš Knežev</i>
10:40-11:00	Coffee break

Session 4-A: *Surface engineering and coatings*

Room: 2.2

Co-Chairs: *Raimondas KREIVAITIS Alexandru Valentin RĂDULESCU*

Hour	Title and authors
11:00-11:20	Modeling of surface finish in selective laser sintering of 316L stainless steel by applying statistical multi- parameter analysis and artificial neural networks. <i>Nikolaos Fountas, John Kechagias, Nikolaos Vaxevanidis, Dimitrios Manolakos</i>
11:20-11:40	Experimental determination of relationship between selected image capturing setup parameters with respect to the quality of the created topography model. <i>Stoyan Slavov, Lyubomir Si Bao Van, Boris Nikolov</i>

11:40-12:00	Analyzing 3D roughness parameters for wear scars in sliding on four-ball tester, lubricated with rapeseed oil. <i>Lorena Deleanu, Constantin Georgescu, George Ghiocel Ojoc, Cornel Suciu, Traian Florian Ionescu</i>
12:00-12:20	An advanced tooling system for planar surfaces layer enhancement by using ball burnishing process and CNC milling machines. <i>Oleksandr Markov, Stoyan Slavov, Georgi Valchev</i>
12:20-12:40	Tribological performance of nanostructured intermetallic electrodeposits at different load-scales. <i>Emmanuel Georgiou, Angelos Koutsomichalis, Nikolaos Vaxevanidis, Dirk Drees, Jean-Pierre Celis</i>
12:40-13:00	Crack Initiation and growth under cyclic loading in steel, hardfacing with aluminum bronze by TIG welding method. <i>Nikolay Valchev, Yaroslav Argirov, Diyan Dimitrov, Tatyana Mechkarova</i>

Session 4-B: *Lubrication 2*

Room: 2.3

Co-Chairs: *Noel BRUNETIERE Ilie MUSCĂ*

<i>Hour</i>	<i>Title and authors</i>
11:00-11:20	Assessing the effectiveness of various fluid and porous material combinations in the process of designing an XPHD thrust bearing. <i>BaPtiste Couderc, Yann Henry, Jean Bouyer, Aurelian Fatu</i>
11:20-11:40	Experimental and numerical study of a high-speed connecting rod journal bearing. <i>Mihail Rădoi, Yann Henry, Aurelian Fatu</i>
11:40-12:00	Bulk flow versus CFD solutions in squeeze film damper analyses. <i>Emanuele Giampaolo, Mihai Arghir, Hugo Festjens</i>
12:00-12:20	Notes regarding the application of the analytical solutions for the squeeze film dampers. <i>Laurențiu Moraru</i>
12:20-12:40	Simulation of the pressure distribution in a textured cell using the finite element method. <i>Victor Gabriel Marian</i>
12:40-13:00	Journal bearing analysis with soft, porous lubrication. <i>Duc Hieu Nguyen, Nicolas Herzig, Romeo Glovnea</i>

Session 4-C: *Tribology in Machine Elements*

Room: 2.1

Co-Chairs: *Michel FILLON Oscar CARVALHO*

<i>Hour</i>	<i>Title and authors</i>
11:00-11:20	Bearing failures in wind turbine gearboxes. <i>Michał Wasilczuk</i>
11:20-11:40	Bearings for shipbuilding and offshore applications lubricated by environmentally acceptable lubricants (EAL) and its water mixtures – results of experimental research. <i>Wojciech Litwin, Michał Wodtke, Jacek Frost</i>
11:40-12:00	Preload testing system for angular contact ball bearings using shape memory alloy modules. <i>Andrei Zamă, Viorel Paleu, Gelu Ianuș</i>
12:00-12:20	Aspects regarding the optimization of mechanical contact between non-standard profile teeth in precessional gearing. <i>Valeriu Dulgheru, Stanislav Slobodeaniuc</i>
12:20-12:40	Analysis of the influence of rings materials and working conditions on the contact pressure of a double cartridge mechanical seal. <i>Andrei Stanciu, Răzvan George Rîpeanu</i>

12:40 -13:00 Experiments and FE simulation for quasi-static operation of a novel elasto-hydrodynamic damper.
Ionuț - Răzvan Nechita, Mircea Pascovici, Petrică Turtoi, Aurelian Fatu, Traian Cicone

13:00-14:15 **LUNCH BREAK**

Session 5-A: *Friction & Wear 3*

Room: 2.2

Co-Chairs: *Marius PUSTAN Michal RUZEK*

Hour

Title and authors

- | | |
|-------------|--|
| 14:15-14:35 | Surface durability of 3D printed polymer gears.
<i>Robert Ciobanu, Ciprian Ion Rizescu, Dana Rizescu</i> |
| 14:35-14:55 | The influence of some factors on the size of the friction coefficient in the case of some specimens from polymeric materials manufactured by 3D printing.
<i>Elisaveta Crăciun, Andrei-Marius Mihalache, Margareta Coteață, Adelina Hrițuc, Marius-Ionuț Rîpanu, Oana Dodun, Gheorghe Nagîț, Laurențiu Slătineanu</i> |
| 14:55-15:15 | Tribological characterization of additively manufactured parts by digital light processing, subjected to linear reciprocating motion.
<i>Gheorghe Macovei, Marcelin Benchea, Viorel Paleu</i> |
| 15:15-15:35 | Research on tribological behavior of plastic material Necuron 1050.
<i>Mirela Romaneț, Ion Nae, George-Răzvan Rîpeanu, Bogdan Roth</i> |
| 15:35-15:55 | Tribological performances of the 3D printed materials used in the construction equipment field.
<i>Aristia Ioana Popovici, Mihail Savaniu</i> |
| 15:55-16:15 | The effect of friction on the stability of movement in the brake disc-pad contact with application to vehicles.
<i>Nicolae-Alexandru Stoica, Alina-Maria Stoica, Andrei Tudor</i> |

Session 5-B: *Lubricants & Tribo-chemistry 2*

Room: 2.3

Co-Chairs: *Victor Gabriel MARIAN Ana-Maria TRUNFIO-SFARGHIU*

Hour

Title and authors

- | | |
|-------------|--|
| 14:15-14:35 | Rheological characterization of mineral oils with additives.
<i>Juliana Javorova, Alexandru Valentin Rădulescu, Anelia Mazdrakova, Vesislava Toteva, Silvia Denkova</i> |
| 14:35-14:55 | The effects of carbon-based nanoparticles on friction, wear, and welding point, in different base oils (mineral and vegetable) and oil blends.
<i>Jack Nasr, Diana Cursaru</i> |
| 14:55-15:15 | Experimental investigation on lubricating grease degradation.
<i>Alexandru Valentin Rădulescu, Irina Rădulescu</i> |
| 15:15-15:35 | Stribeck curve for lubricants with vegetal oils.
<i>Lorena Deleanu, Constantin Georgescu, Dionis Guglea, George Cătălin Cristea</i> |
| 15:35-15:55 | Tribological evaluation of the performance of trimethylolpropane ester bio-lubricants based on fatty acids from sunflower oil.
<i>Petrică Turtoi, Julien Delcuze, Ionuț - Răzvan Nechita, Alice Marinescu</i> |
| 15:55-16:15 | Rheological research regarding internal combustion engine oils.
<i>Andreea Mirela Teleașă, Alexandru Valentin Rădulescu, Sorin Cănanău, Geanina Mihaela Mateescu, Andreea Ștefania Stan</i> |

CONFERENCE CLOSURE



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Our businesses cover the entire oil and gas chain, from crude oil and natural gas exploration and production to power generation, transportation, refining, petroleum product marketing, and international crude oil and product trading. TotalEnergies is also a large-scale chemicals manufacturer.

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Service activities for dynamic machinery ✓



Diagnostic & spectral analysis equipment



Modern maintenance systems for dynamic machines ✓



Technical assistance ✓



Training of the personnel involved in the maintenance ✓



Program SATURDAY, April 20th *Conference trip*

A bus trip will be organized on **Saturday, April 20th, 2024**. The departure is scheduled for 8:00 from the front of the Conference Center, with an estimated return time around 19:00. The trip will start with a visit to the **largest salt mine in Europe** (Slănic Prahova).

The beginnings of the history of the **Slănic Prahova** salt mine date back to around **1685**, the year in which the owner **Mihail Cantacuzino** found out that there was a salt deposit in the Slănic Prahova region. Thus, wanting to open a mine, he bought the Slănic estate.

The **maximum depth of the mine is 217m**, and its trapezoidal chambers measure **55m high**, the **total area** of the mine being approximately **80,000m²**. The circuit runs around the enormous pillar that supports the mine.

In this "salt palace", open to visitors since the '70s, the microclimate is constant and cannot be reproduced on the surface: temperature of **12-13°C**, relative **air humidity of 50-60%**, radioactivity at the limit of detection, atmospheric pressure with 18mmHg higher than on the surface, high concentration of natural saline aerosols, lack of plant allergens, rarity of conditional-pathogenic germs and lack of pathogenic ones.

Our trip will continue with a stopover to one of the most renowned wineries situated on the wine road Dealu Mare, accompanied by a **wine tasting** (Budureasca & Ceptura) and **lunch at Ceptura Mansion**. A visit of the **Ceptura Winery** is also included.

Located in the south of Romania, the Dealu Mare Vineyards stretch across the counties of Prahova and Buzău. It is the most compact and largest wine growing area in Romania. The area is divided into **8 DOC centers**.





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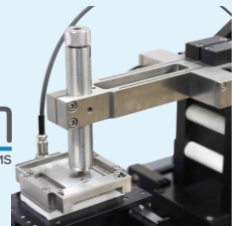
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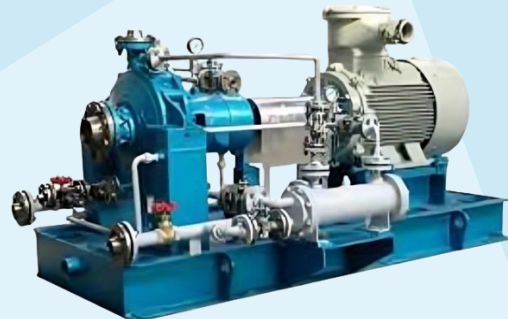
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