



Under the aegis of the

ROMANIAN MINISTRY OF EDUCATION

ROMANIAN MINISTRY OF RESEARCH AND INNOVATION

# ROTRIB'19

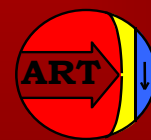
## Conference Program

The 14<sup>th</sup> International Conference on Tribology  
September 19-21, 2019 – Cluj Napoca, ROMANIA

organized by



**TECHNICAL UNIVERSITY**  
OF CLUJ-NAPOCA



**Romanian Tribology**  
Association

# ROTRIB'19

**ROTRIB'19** is the 14<sup>th</sup> Conference organized in Romania in a series of international scientific events on the subject of TRIBOLOGY. The general objective of this conference is to bring contributions to the fundamental applications and experiments in the field of Tribology and Nanotribology. The conference will provide an interdisciplinary forum for discussions and networking as well as the aim to initiate collaborations among specialists regarding materials in Tribology and their application in product design and reliability at macro/ micro and nano- scale. The exchange of ideas, theories, developments, innovations, improved research methods and future trends is a key scope of this conference. This goal will be achieved by bringing together specialists from industry and academic environment, leading and young researchers from various scientific fields.

Papers presented at ROTRIB 2019 are included in the following topics:

1. Friction and Wear
2. Contact Mechanics
3. Biotribology, tribology in medicine
4. Micro and nanotribology
5. Lubricants
6. Lubrication
7. Tribochemistry and tribocorrosion
8. Tribology of machine elements
9. Tribology in manufacturing processes
10. Surface metrology, surface engineering and coatings
11. Emerging technologies and industrial tribology
12. Condition monitoring

These topics will be discussed in different technical sessions. The official language of ROTRIB'19 Conference is English. The conference received an excellent number of submissions from which, after a thorough peer reviewing process, 66 scientific contributions were accepted for presentation. The authors of the accepted papers were invited to present their work at the Conference, and so, we are pleased to welcome 87 participants from different countries.

The Conference program is enriched significantly by plenary presentations of renowned experts in their respective domains: Distinguished Professor Dr. Aurelio Somà (Italy) and Distinguished Professor Dr. Spiridon Cretu (Romania). Conference ROTRIB'19 is organized by Technical University of Cluj-Napoca and Romanian Tribology Association, under the aegis of Romanian Ministry for Research and Innovation. The Conference will be held in Cluj-Napoca, ROMANIA at Technical University of Cluj-Napoca.

The Conference is financially supported by Technical University of Cluj-Napoca, Romanian Tribology Association, and our sponsors, which will participate at ROTRIB'19 with company profile presentations or product exhibition. We would like to express our gratitude to the authors for submitting their work. We would like to thank to all those who have contributed, in one way or another, to the success of the Conference. We are grateful to the Scientific Committee members, as well as to the external reviewers for their volunteer hard work of reading and discussing the submissions. We would like to express our thanks to the members of the Organizing Committee for their support.

It was a great pleasure for us to organize this Conference and we hope that, the ROTRIB'19 Conference will stimulate future developments and innovations in the field of tribology.

***We wish to all participants a successful conference and a pleasant time in Cluj-Napoca.***

**Organizing Committee  
September 2019, Cluj-Napoca, Romania**

# Committees

## Chair of Conference:

Prof. Marius PUSTAN

## Conference Co-Chairs:

Prof.Dr. Minodora RIPA  
Prof.Dr. Traian CICONE

Prof.Dr. Andrei TUDOR  
Prof.Dr. Razvan George RIPEANU

## Honorary Committee:

Prof. Napoleon ANTONESCU  
Prof. Spiridon CRETU  
Prof. Mihai GAFITANU

Prof. Mircea PASCOVICI  
Prof. Liviu PALAGHIAN  
Prof. Dumitru POP

## Scientific Committee:

|                              |           |                              |           |
|------------------------------|-----------|------------------------------|-----------|
| Assoc. Prof. Emilia ASSENOVA | <b>BG</b> | Prof. Jan MEHNER             | <b>DE</b> |
| Prof. Arturo AYON            | <b>US</b> | Prof. Athanassios MIHAILIDIS | <b>GR</b> |
| Prof. Bou-Said BENYEBKA      | <b>FR</b> | Prof. Slobodan MITROVIC      | <b>RS</b> |
| Prof. Corina BIRLEANU        | <b>RO</b> | Dr. Raluca MULLER            | <b>RO</b> |
| Prof. Mihaela BUCIUMEANU     | <b>RO</b> | Prof. Ilie MUSCA             | <b>RO</b> |
| Prof. Traian CICONE          | <b>RO</b> | Prof. Nikolai MYSHKIN        | <b>BY</b> |
| Prof. Lorena DELEANU         | <b>RO</b> | Prof. Iuliu NEGREAN          | <b>RO</b> |
| Assoc Prof. Adrian DRUMEANU  | <b>RO</b> | Prof. Daniel NELIAS          | <b>FR</b> |
| Prof. Valeriu DULGHERU       | <b>MD</b> | Prof. Ludovic NOELS          | <b>BE</b> |
| Prof. Nuria ESPALLARGAS      | <b>NO</b> | Prof. Dumitru OLARU          | <b>RO</b> |
| Prof. Aurelian FATU          | <b>FR</b> | Prof. Razvan George RIPEANU  | <b>RO</b> |
| Prof. Michel FILLON          | <b>FR</b> | Prof. Alexandru RADULESCU    | <b>RO</b> |
| Dr. Romeo GLOVNEA            | <b>UK</b> | Prof. Filipe Samuel SILVA    | <b>PT</b> |
| Prof. Simion HARAGAS         | <b>RO</b> | Prof. Aurelio SOMÀ           | <b>IT</b> |
| Prof. Hakan KALELI           | <b>TR</b> | Prof. Marian SZCZEREK        | <b>PL</b> |
| Prof. Mara KANDEVA           | <b>BG</b> | Prof. Andrei TUDOR           | <b>RO</b> |
| Prof. M. Baki KARAMIS        | <b>TR</b> | Prof. Aleksandar VENCL       | <b>RS</b> |

## Organizing Committee

### Chair:

Prof. Corina BIRLEANU

### Members:

Prof. Traian CICONE  
Lecturer Stefan CRACIU  
Assist. Horea CRISAN  
Lecturer Felicia CRISTEA  
Prof. Simion HARAGAS

Drd. Ionut MARIES  
Lecturer Violeta MERIE  
Prof. Marius PUSTAN  
Prof. Minodora RIPA  
Lecturer Florina SERDEAN

# Day 1 Schedule

# DAY 1 - SEPTEMBER 19, 2019

## - GENERAL SCHEDULE -

| TECHNICAL PROGRAM                   |   |                        |                             |             |                       |               |
|-------------------------------------|---|------------------------|-----------------------------|-------------|-----------------------|---------------|
| DAY 1 - SEPTEMBER 19 , 2019         |   |                        |                             |             |                       |               |
| 8:30-9:30 PARTICIPANTS REGISTRATION |   |                        |                             |             |                       |               |
| SCHEDULE                            |   | AULA CENTENAR          |                             |             |                       |               |
| 09:30-10:45                         | 9:30-9:45   | Opening Ceremony       |                             |             |                       |               |
|                                     | 9:45-10:15  | <b>Plenary session</b> | PLEN 1                      |             |                       |               |
|                                     | 10:15-10:45   |                        | PLEN 2                      |             |                       |               |
| 10:45-11:00                         | COFFEE BREAK  |                        |                             |             |                       |               |
| SCHEDULE                            |   | AULA CENTENAR          |                             |             |                       |               |
| 11:00-12:30                         | 11:00-11:30   | <b>Plenary session</b> | PLEN 3 Company presentation |             |                       |               |
|                                     | 11:30-12:00   |                        | PLEN 4 Company presentation |             |                       |               |
|                                     | 12:00-12:30   |                        | PLEN 5 Company presentation |             |                       |               |
| 12:30-14:00                         | LUNCH -EMERSON ROOM                                     |                        |                             |             |                       |               |
| SCHEDULE                            |   | Topic                  | Room A11                    |             | Topic                 | Room A06      |
| 14:00-16:00                         | 14:00-14:20   | <b>TM</b>              | <b>TM 1</b>                 |             | <b>FW</b>             | <b>FW 1</b>   |
|                                     | 14:20-14:40   |                        | <b>TM 2</b>                 | <b>FW 2</b> |                       |               |
|                                     | 14:40-15:00   |                        | <b>TM 3</b>                 | <b>FW 3</b> |                       |               |
|                                     | 15:00-15:20   |                        | <b>TM 4</b>                 | <b>FW 4</b> |                       |               |
|                                     | 15:20-15:40   |                        | <b>TM 5</b>                 | <b>FW 5</b> |                       |               |
|                                     | 15:40-16:00   |                        | <b>TM 6</b>                 | <b>FW 6</b> |                       |               |
| 16:00-16.10                         | COFFEE BREAK  |                        |                             |             |                       |               |
| 16.10-17.50                         | 16.10-16:30   | <b>CMech</b>           | <b>CMech 1</b>              |             | <b>ConM &amp; TMP</b> | <b>ConM 1</b> |
|                                     | 16:30-16:50   |                        | <b>CMech 2</b>              |             |                       | <b>ConM 2</b> |
|                                     | 16:50-17:10   |                        | <b>CMech 2</b>              |             |                       | <b>ConM 3</b> |
|                                     | 17:10-17:30   |                        | <b>CMech 4</b>              |             |                       | <b>ConM 4</b> |
|                                     | 17:30-17:50   |                        | <b>CMech 5</b>              |             |                       | <b>TMP 1</b>  |
| 19:00                               | CONFERENCE GALA DINNER<br>Restaurant Grand Hotel Napoca |                        |                             |             |                       |               |

# DAY 1 - SEPTEMBER 19, 2019

## 8:30 – 14:00

## PLENARY SESSIONS

| SEPTEMBER 19, 2019 – DAY 1  |   | 08:30-10:45  |
|---|---|--|
| 08:30-09:30   | Participants Registration, welcome coffee |  |
| 9:30-9:45   | Opening Addresses                         |  |
| PLENARY SESSION   |   | 9:45-10:45   |
| Chairman: Prof.dr. Marius Pustan (Romania)<br>Co-chairman: Prof.dr. Thami Zeghloul (France)     |   |  |
| 9:45-10:15  | PLEN 1                                    | Professor dr. Aurelio Somà - University of Torino: A survey of mechanical failure and design for reliability of MEMS   |
| 10:15-10:45   | PLEN 2                                    | Professor dr. Spiridon Cretu- Gheorghe Asachi Technical University of Iasi, Analyses of concentrated contacts from machine parts by semi-analytic methods. Advantages and limits     |
| 10:45-11:00   | Coffee break                              |  |
| PLENARY SESSION   |   | 11:00-12:30  |
| Chairman: Prof.dr. Corina Birleanu (Romania)<br>Co-chairman: Prof.dr. Aleksandar Venci (Serbia) |   |  |
| 11:00-11:30   | PLEN 3                                    | <b>Company presentation</b> , Bryan A. Crawford - Nanoindenter Group, KLA, USA: Assessing hardness and substrate independent elastic moduli of surface coatings with nanoindentation |
| 11:30-12:00   | PLEN 4                                    | <b>Company presentation</b> , Dr. Alexander Minewitsch - TTZH Tribology solutions for testing and analyses of engineered surfaces, materials and lubricants                          |
| 12:00-12:30   | PLEN 5                                    | <b>Company presentation</b> , Dr. Gabriela Ploesteanu - SC TECHNO VOLT SRL, Romania – Educational equipments for tribology and mechanical laboratories                               |
| 12:30-14:00   | LUNCH                                     |  |

# DAY 1 - SEPTEMBER 19, 2019

## 14:00 – 16:10

### TRIBOLOGY OF MACHINE ELEMENTS (TM)

| SEPTEMBER 19, 2019 – DAY 1  | 14:00-16:00         | ROOM A11  |
|---|---------------------|---|
| <b>TRIBOLOGY OF MACHINE ELEMENTS (TM)</b>   |                     |   |
| Chairman: Prof.dr. Mihaela Buciumeanu (Romania)<br>Co-chairman: Prof.dr. Alexandru Valentin Radulescu (Romania) |                     |   |
| 14:00-14:20   | TM1                 | Abrasive flow modelling through active parts water jet machine using CFD simulation<br><i>Iulian Patirnac, Razvan George Ripeanu and Eugen Laudacescu</i><br>ROMANIA                                      |
| 14:20-14:40   | TM2                 | Friction phenomenon study for the chain link – pin joint<br><i>Cornel Catalin Gavrilă and Mihai Tiberiu Lates</i><br>ROMANIA  |
| 14:40-15:00   | TM3                 | Comparative study of the friction phenomenon in the contact between the guide and the bush and silent chain links<br><i>Mihai Tiberiu Lates and Cornel Catalin Gavrilă</i><br>ROMANIA                     |
| 15:00-15:20   | TM4                 | Research on mechanical and geometrical characteristics of materials used for flexible tubing production<br><i>Adrian Hagianu, Ion Nae, Gabriela Cristina Ionescu and Razvan George Ripeanu</i><br>ROMANIA |
| 15:20-15:40   | TM5                 | Oil temperature influence on friction losses in silent chains<br><i>Radu Velicu</i><br>ROMANIA  |
| 15:40-16:00   | TM6                 | Experimental determination of the loading capacity of the elastic bracelet assembly<br><i>Ionut Geonea, Nicolae Dumitru, Cristian Copilusi and Alexandru Margine</i><br>ROMANIA                           |
| 16.00-16:10   | <b>Coffee break</b> |   |

# DAY 1 - SEPTEMBER 19, 2019

## 14:00 – 16:10

### FRICITION AND WEAR (FW)

| SEPTEMBER 19, 2019 – DAY 1   |                     | 14:00-16:00   | ROOM A06 |
|--|---------------------|---|----------|
| <b>FRICITION AND WEAR (FW)</b>   |                     |   |          |
| Chairman: Prof.dr. Minodora Ripa (Romania)<br>Co-chairman: Prof.dr. Emilia Assenova (Bulgaria) |                     |   |          |
| 14:00-14:20  | FW1                 | A bibliometric analysis of scientific research on tribology of composites in Southeastern Europe<br><i>Aleksandar Venci, Nikolaos Vaxevanidis and Mara Kandeva</i><br>SERBIA  |          |
| 14:20-14:40  | FW2                 | Numerical considerations regarding the occurrence of plastic shearing with implications in scuffing<br><i>Ilie Musca and Michaela Fomin</i><br>ROMANIA  |          |
| 14:40-15:00  | FW3                 | Abrasive and erosion wear of composite NiCrSiB coatings inflicted whit subsonic flammable structure through a cold process<br><i>Mara Kandeva, Todor Penyashki, Georgi Kostadinov and Zhecho Kalichin</i><br>Bulgaria |          |
| 15:00-15:20  | FW4                 | Structural and tribological properties of wear resistant coatings obtained by electrospark deposition<br><i>Todor Penyashki, Dimitar Radev, Mara Kandeva and Georgi Kostadinov</i><br>Bulgaria                        |          |
| 15:20-15:40  | FW5                 | Effects of organic compounds and nickel nitrate on friction coefficient of thermosetting<br><i>Iulian Păduraru, Gabriel Săracu, Mihail Bogdan, Iulia Graur, Cristian Muntenita and Adrian Circiumaru</i><br>ROMANIA   |          |
| 15:40-16:00  | FW6                 | Tribological behaviour of sealing materials<br><i>Corina Birleanu, Marius Pustan, Cosmin Cosma, Violeta Merie and Ovidiu Dranda</i><br>ROMANIA  |          |
| 16.00-16:10  | <b>Coffee break</b> |   |          |



# DAY 1 - SEPTEMBER 19, 2019

## 16:10 – 17:50

## CONTACT MECHANICS (CMech)

| SEPTEMBER 19, 2019 – DAY 1   |                        | 16:10-17:50   | ROOM A11 |
|--|------------------------|---|----------|
| <b>CONTACT MECHANICS (CMech)</b>   |                        |   |          |
| Chairman: Prof.dr. Traian Cicone (Romania)<br>Co-chairman: Prof.dr. Lorena Deleanu (Romania) |                        |   |          |
| 16.10-16:30  | CMech1                 | Evaluation of stress risers severity in spur gears meshing<br><i>Spiridon Cretu</i><br>ROMANIA  |          |
| 16:30-16.50  | CMech2                 | Theoretical analysis of spherical bearings lubricated with greases<br><i>Alexandru Valentin Radulescu and Irina Radulescu</i><br>ROMANIA                      |          |
| 16.50-17.10  | CMech3                 | Surface roughness influence on active surfaces geometry and modified rating life of rolling contacts<br><i>Marcelin Benchea and Spiridon Cretu</i><br>ROMANIA |          |
| 17.10-17:30  | CMech4                 | The fretting contact of coated bodies. part i – contact parameters<br><i>Sergiu Spinu and Delia Cerlinca</i><br>ROMANIA                                       |          |
| 17:30-17.50  | CMech5                 | The fretting contact of coated bodies. part ii – the stress state<br><i>Sergiu Spinu and Delia Cerlinca</i><br>ROMANIA  |          |
| 19:30  | CONFERENCE GALA DINNER |   |          |

# DAY 1 - SEPTEMBER 19, 2019

## 16:10 – 17:50

### CONDITION MONITORING (ConM), TRIBOLOGY IN MANUFACTURING PROCESSES (TMP)

| SEPTEMBER 19, 2019 – DAY 1  |                               | 16:10-17:50  | ROOM A06 |
|---|-------------------------------|--|----------|
| <b>CONDITION MONITORING (ConM), TRIBOLOGY IN MANUFACTURING PROCESSES (TMP)</b>                                |                               |  |          |
| Chairman: Prof.dr. Razvan George Ripeanu (Romania)<br>Co-chairman: Assoc. prof.dr. Emilia Assenova (Bulgaria) |                               |  |          |
| 16.10-16:30   | ConM1                         | Some considerations regarding the influence of working conditions on the corrosion wear of the injection water treatment plant equipment<br><i>Cristian Dudu, Adrian Catalin Drumeanu, Razvan George Ripeanu, Alin Dinita</i><br>ROMANIA                   |          |
| 16:30-16.50   | ConM2                         | Considerations regarding determination of optimal preventive maintenance periodicity for subsurface sucker rod pumps<br><i>Adrian Catalin Drumeanu</i><br>ROMANIA  |          |
| 16.50-17.10   | ConM3                         | Lubricants condition monitoring by using a global performance passport<br><i>Irina Radulescu and Alexandru Valentin Radulescu</i><br>ROMANIA   |          |
| 17.10-17:30   | ConM4                         | Microscopic testing and analysis of drinking water filters after the final life cycle, using an experimental stand<br><i>Horea George Crişan, Oana Adriana Crişan, Marius Sorin Pustan, Corina Julieta Birleanu and Violeta Valentina Merie</i><br>ROMANIA |          |
| 17:30-17.50   | TMP 1                         | Erosion modelling: A systematic review of available models and equations<br><i>Adrian Lospa, Razvan George Ripeanu and Alin Dinita</i><br>ROMANIA  |          |
| 19:00   | <b>CONFERENCE GALA DINNER</b> |  |          |

# Day 2 Schedule

# DAY 2 - SEPTEMBER 20, 2019

## - GENERAL SCHEDULE -

| TECHNICAL PROGRAM          |                            |       |          |  |             |          |
|----------------------------|----------------------------|-------|----------|--|-------------|----------|
| DAY 2 - SEPTEMBER 20, 2019 |                            |       |          |  |             |          |
| SCHEDULE                   |                            | Topic | Room A11 |  | Topic       | Room A06 |
| 9:00-11:20                 | 9:00-9:20                  | Ln    | -        |  | Lts & EmerT | Lts 1    |
|                            | 9:20-9:40                  |       | Ln 1     |  |             | Lts 2    |
|                            | 9:40-10:00                 |       | Ln 2     |  |             | Lts 3    |
|                            | 10:00-10:20                |       | Ln 3     |  |             | Lts 4    |
|                            | 10:20-10:40                |       | Ln 4     |  |             | EmerT 1  |
|                            | 10:40-11:00                |       | Ln 5     |  |             | EmerT 2  |
|                            | 11:00-11:20                |       | Ln 6     |  |             | EmerT 3  |
| 11:20-11:40                | COFFEE BREAK               |       |          |  |             |          |
| 11:40-13:00                | 11:40-12:00                | MN    | MN 1     |  | BioT        | BioT 1   |
|                            | 12:00-12:20                |       | MN 2     |  |             | BioT 2   |
|                            | 12:20-12:40                |       | MN 3     |  |             | BioT 3   |
|                            | 12:40-13:00                |       | MN 4     |  |             | BioT 4   |
| 13:00-14:20                | LUNCH – EMERSON ROOM       |       |          |  |             |          |
| 14:20-16:00                | 14:20-14:40                | CMech | CMech 6  |  | FW          | FW 7     |
|                            | 14:40-15:00                |       | CMech 7  |  |             | FW 8     |
|                            | 15:00-15:20                |       | CMech 8  |  |             | FW 9     |
|                            | 15:20-15:40                |       | CMech 9  |  |             | FW 10    |
|                            | 15:40-16:00                |       | CMech 10 |  |             | FW 11    |
| 16:00-16:10                | COFFEE BREAK               |       |          |  |             |          |
| 16:10-17:50                | 16:10-16:30                | TM    | TM 7     |  | SE          | SE 1     |
|                            | 16:30-16:50                |       | TM 8     |  |             | SE 2     |
|                            | 16:50-17:10                |       | TM 9     |  |             | SE 3     |
|                            | 17:10-17:30                |       | TM 10    |  |             | SE 4     |
|                            | 17:30-17:50                |       | TM 11    |  |             | SE 5     |
| 17:50-18:00                | ROTRIB'19 Closing Ceremony |       |          |  |             |          |

# DAY 2 - SEPTEMBER 20, 2019

## 9:20 – 11:20 LUBRICATION (LN)

| SEPTEMBER 20, 2019 – DAY 2   |                     | 09:20-11:20   | ROOM A11 |
|--|---------------------|---|----------|
| <b>LUBRICATION (Ln)</b>  |                     |   |          |
| Chairman: Prof.dr. Gencaga Purcek (Turkey)<br>Co-chairman: Assoc. Prof. dr. Romeo Glovnea (UK) |                     |   |          |
| 9:20-9:40  | Ln1                 | The effect of working parameters upon oil-lubricated ehd contacts subjected to load variation<br><i>Xingnan Zhang and Romeo Glovnea</i><br>UNITED KINGDOM           |          |
| 9:40-10:00   | Ln2                 | An experimental approach to predict the behaviour of ehd contacts under harmonic loading<br><i>Xingnan Zhang and Romeo Glovnea</i><br>UNITED KINGDOM                |          |
| 10:00-10:20  | Ln3                 | Influence of lubricant on the friction in an angular contact ball bearing under low load conditions<br><i>Andrei Popescu and Dumitru Olaru</i><br>ROMANIA           |          |
| 10:20-14:00  | Ln4                 | A simple analytical model for an elastohydrostatic thrust bearing<br><i>Traian Cicone, Alice Alina Marinescu and ștefan Sorohan</i><br>ROMANIA                      |          |
| 10:40-11:00  | Ln5                 | Evaluation of inertia effects in planar squeeze flow inside soft, porous layers<br><i>Georgian Lupu, Petrică Turtoi and Traian Cicone</i><br>ROMANIA                |          |
| 11:00-11:20  | Ln6                 | Some considerations about the effect of grooves on the viscous coupling performances<br><i>Andrei-Iancu Stoicescu, Adrian Predescu and Valentin Gatu</i><br>ROMANIA |          |
| 11.20-11:40  | <b>Coffee break</b> |   |          |

# DAY 2 - SEPTEMBER 20, 2019

9:00 – 11:20

## LUBRICANTS, EMERGING TECHNOLOGIES AND INDUSTRIAL TRIBOLOGY (Lts & EmerT)

| SEPTEMBER 20, 2019 – DAY 2   |                     | 09:00-11:20   | ROOM A06 |
|--|---------------------|---|----------|
| <b>LUBRICANTS (Lts), EMERGING TECHNOLOGIES AND INDUSTRIAL TRIBOLOGY (EmerT)</b>                  |                     |   |          |
| Chairman: Prof.dr. Mara Kandevea (Bulgaria)<br>Co-chairman: Lecturer.dr. Violeta Merie (Romania) |                     |   |          |
| 9:00-9:20  | Lts1                | Experimental research regarding the tribological properties of a hydraulic oil<br><i>Simion Haragâș, Dumitru Pop, Felicia Cristea and Ovidiu Buiga</i><br>ROMANIA   |          |
| 9:20-9:40  | Lts2                | Influence of ZnO concentration in rapeseed oil on tribological behavior<br><i>Traian Florian Ionescu, Dionis Guglea, Constantin Georgescu, Dumitru Dima and Lorena Deleanu</i><br>ROMANIA                                 |          |
| 9:40-10:00   | Lts3                | Tribological behavior of rapeseed oil additivated with hexagonal boron nitride<br><i>Dionis Guglea, Traian Florian Ionescu, Dumitru Dima, Constantin Georgescu and Lorena Deleanu</i><br>ROMANIA                          |          |
| 10:00-10:20  | Lts4                | Nano-diamond and nano-graphite testing as additive for an engine lubrication oil<br><i>Dan Moldovanu, Andreia Molea and Istvan Barabas</i><br>ROMANIA   |          |
| 10:20-10:40  | EmerT1              | Factors influencing the triboelectric charging of granular plastics in a rotating-cylinder-type tribocharger<br><i>Imed Eddine Achouri, Thami Zeghloul, Karim Medles, Gontran Richard and Lucien Dascalescu</i><br>FRANCE |          |
| 10:40-11:00  | EmerT2              | Standardization in testing ballistic protection systems<br><i>George Ghiocel Ojoc, Catalin Pirvu, Simona Sandu and Lorena Deleanu</i><br>ROMANIA  |          |
| 11:00-11:20  | EmerT3              | Study of the effect of duration of non-thermal plasma treatment on the surface properties of polymers<br><i>Omar Tilmatine, Thami Zeghloul, Aurelian Fatu and Lucien Dascalescu</i><br>FRANCE                             |          |
| 11.20-11:40  | <b>Coffee break</b> |   |          |

# DAY 2 - SEPTEMBER 20, 2019

## 11:40 – 13:00

## MICRO AND NANOTRIBOLOGY (MN)

| SEPTEMBER 20, 2019 – DAY 2  | 11:40-13:00  | ROOM A11  |
|---|--------------|---|
| <b>MICRO AND NANOTRIBOLOGY (MN)</b>   |              |   |
| Chairman: Prof. dr. Aurelio Soma (Italy)<br>Co-chairman: Dr. Rodica Voicu (Romania) |              |   |
| 11:40-12:00   | MN1          | Effect of deposition oxygen pressure on the properties of cuprous oxide thin films<br><i>Marius Pustan, Corina Birleanu, Violeta Merie, Liviu Zarbo, Sorina Garabagiu and Daniel Marconi</i><br>ROMANIA       |
| 12:00-12:15   | MN2          | A study for an aluminum electro-thermally actuated U-shaped microtweezer<br><i>Rodica Voicu, Marius Pustan, Corina Birleanu, Raluca Gavrila, Cosmin Romanitan, Oana Tutunaru and Alina Cismaru</i><br>ROMANIA |
| 12:15-12:30   | MN3          | Nanoscale friction and wearing of octadecyltrichlorosilane covered silicon surface<br><i>Sabina Teodoroff-Onesim, Alexandra Besleaga, Lucel Sirghi</i><br>ROMANIA   |
| 12:30-13:00   | MN4          | Research concerning the end-effectors for simplex microgripper<br><i>Simona Noveanu, Calin Rusu, Camelia Rancea and Daniel Lates</i><br>ROMANIA   |
| 13:00-14:20   | <b>LUNCH</b> |   |

# DAY 2 - SEPTEMBER 20, 2019

## 11:40 – 13:00

### BIOTRIBOLOGY AND TRIBOLOGY IN MEDICINE (BioT)

| SEPTEMBER 20, 2019 – DAY 2  | 11:40-13:00  | ROOM A06   |
|---|--------------|--|
| <b>BIOTRIBOLOGY and TRIBOLOGY IN MEDICINE (BioT)</b>  |              |  |
| Chairman: Prof.dr Emilia Assenova (Bulgaria)<br>Co-chairman: Dr. Liliana-Laura Badita (Romania) |              |  |
| 11:40-12:00   | BioT1        | Validation of professional tooth brushing test device, test methodology and analysis<br><i>Bogdan Mircea Achimescu, Sorin Ciortan and Mihaela Buciumeanu</i><br>ROMANIA          |
| 12:00-12:20   | BioT2        | Fretting manifestations in total hip prosthesis<br><i>Lucian Capitanu, Liliana-Laura Badita, Virgil Florescu, Constantin Tiganesteanu and Liviu Florin Isvoranu</i><br>ROMANIA   |
| 12:20-12:40   | BioT3        | Dynamic and tribological contact study for human fingertips at very low speeds<br><i>Andrei Calin, Andrei Tudor, Marilena Stoica, Nicolae Stoica and Kussay Subhi</i><br>ROMANIA |
| 12:40-13:00   | BioT4        | Friction forces on human finger skin<br><i>Cezara Mariuca Oprisan, Bogdan Chiriac, Vlad Carlescu and Dumitru Olaru</i><br>ROMANIA  |
| 13:00-14:20   | <b>LUNCH</b> |  |



# DAY 2 - SEPTEMBER 20, 2019

## 14:20 – 16:00

# CONTACT MECHANICS (CMech)

| SEPTEMBER 20, 2019 – DAY 2  |                     | 14:20-16:00  | ROOM A11 |
|---|---------------------|--|----------|
| <b>CONTACT MECHANICS (CMech)</b>  |                     |  |          |
| Chairman: Prof.dr. Spiridon Crețu (Romania)<br>Co-chairman: Prof.dr. Simion Haragas (Romania) |                     |  |          |
| 14:20-14:40   | CMech6              | Fractal evaluation aspects in characterizing the roughness of a driving wheel from a locomotive<br><i>Laura Babici, Andrei Tudor, Jordi Romeu Garbi and Marilena Stoica</i><br>ROMANIA |          |
| 14:40-15:00   | CMech7              | Comparative study on the behaviour of a serial robot RRR and hand-arm human systems<br><i>Cristea Aurora Felicia</i><br>ROMANIA  |          |
| 15:00-15:20   | CMech8              | Tooth contact analysis of spur and helical gears with crowned profile for pinion<br><i>Stelian Cazan, Claudiu Dănilă and Spiridon Crețu</i><br>ROMANIA                                 |          |
| 15:20-15:40   | CMech9              | The influence of operating temperature and bearing steel structure in shakedown of three-dimensional elastic-plastic rolling contacts<br><i>Gabriel Popescu</i><br>ROMANIA             |          |
| 15:40-16:00   | CMech10             | A study of the crack initiation angle in the substrate of spur gear teeth subjected to rolling contact fatigue<br><i>Claudiu Ovidiu Popa</i><br>ROMANIA                                |          |
| 16.00-16:10   | <b>Coffee break</b> |  |          |

# DAY 2 - SEPTEMBER 20, 2019

## 14:20 – 16:00

### FRICITION AND WEAR

### (FW)

| SEPTEMBER 20, 2019 – DAY 2  |                     | 14:20-16:00   | ROOM A06 |
|---|---------------------|---|----------|
| <b>FRICITION AND WEAR (FW)</b>  |                     |   |          |
| Chairman: Prof.dr. Ilie Musca (Romania)<br>Co-chairman: Assoc. prof.dr. Adrian Catalin Drumeanu (Romania) |                     |   |          |
| 14:20-14:40   | FW7                 | Effect of steel fiber addition on mechanical and tribological behavior of composite brake pad materials<br><i>Harun Yanar, Gencaga Purcek and H. Hüseyin Ayar</i><br>TURKEY                       |          |
| 14:40-15:00   | FW8                 | Ball-on-flat reciprocating test to evaluate dry sliding wear behaviour of reinforced polymer composites<br><i>Virgil Iliuta, Minodora Ripa, Juliana Javorova and Gabriel Andrei</i><br>ROMANIA    |          |
| 15:00-15:20   | FW9                 | Preliminary study of friction in automotive ball joints<br><i>Ilie Musca, Ionuț Cristian Romanu, Andrei Gagea</i><br>ROMANIA  |          |
| 15:20-15:40   | FW10                | Wear's issues on high-pressure common rail pumps<br><i>Carmen Bujoreanu, Razvan Constantin Iordache and Narcis Daniel Petrea</i><br>ROMANIA   |          |
| 15:40-16:00   | FW11                | Determining the tribological properties of different 3D printing filaments<br><i>Ionut-Tudor Maries, Vilau Cristian, Pustan Marius Sorin, Dudescu Cristian and Crisan Horea George</i><br>ROMANIA |          |
| 16:00-16:10   | <b>Coffee break</b> |   |          |

# DAY 2 - SEPTEMBER 20, 2019

## 16:10 – 17:50

## TRIBOLOGY OF MACHINE ELEMENTS (TM)

| SEPTEMBER 20, 2019 – DAY 2  |                         | 16:10-17:50   | ROOM A11 |
|---|-------------------------|---|----------|
| <b>TRIBOLOGY OF MACHINE ELEMENTS (TM)</b>   |                         |   |          |
| Chairman: Prof.dr. Andrei Tudor (Romania)<br>Co-chairman: Prof.dr. Lorena Deleanu (Romania) |                         |   |          |
| 16:10-16:30   | TM7                     | On thermal calculation for helical gear transmission system<br><i>Sorin Gabroveanu, Sorin Cananau, Radu-Florin Mirica and Alexandru Ilies</i><br>ROMANIA  |          |
| 16:30-16:50   | TM8                     | Proposed parameter for the characterization of friction in cylindrical gears teeth contact<br><i>Stelian Alaci, Carmen Bujoreanu, Narcis Daniel Petrea, Florina Carmen Ciornei and Luminita Irimescu</i><br>ROMANIA |          |
| 16:50-17:10   | TM9                     | Power loss in grease lubricated ball bearings<br><i>Gelu Ianus, Denis Cojocaru, Cezara Mariuca Oprisan, Viorel Paleu and Dumitru Olaru</i><br>ROMANIA   |          |
| 17:10-17:30   | TM10                    | Eccentric device for varying the gear ratio<br><i>Mihail Bogdan -Roth, Mirela Romanet and Razvan George Ripeanu</i><br>ROMANIA  |          |
| 17:30-17:50   | TM11                    | Preliminary theoretical results of limited slip couplings<br><i>Valentin Gatu, Adrian Predescu and Andrei-Iancu Stoicescu</i><br>ROMANIA  |          |
| 17:50-18:00   | <b>Closing Ceremony</b> |   |          |

# DAY 2 - SEPTEMBER 20, 2019

## 16:10 – 17:50

# SURFACE METROLOGY, SURFACE ENGINEERING & COATINGS (SE)

| SEPTEMBER 20, 2019 – DAY 2   |                         | 16:10-17:50  | ROOM A06 |
|--|-------------------------|--|----------|
| <b>SURFACE METROLOGY, SURFACE ENGINEERING AND COATINGS (SE)</b>                                    |                         |  |          |
| Chairman: Prof.dr. Minodora Ripa (Romania)<br>Co-chairman: Assoc. Prof. dr. Viorel Paleu (Romania) |                         |  |          |
| 16:10-16:30  | SE1                     | Temperature effect on the mechanical behaviour of niobium nitride thin films<br><i>Violeta Merie, Gavril Negrea, Corina Bîrleanu, Horea Crişan and Marius Pustan</i><br>ROMANIA  |          |
| 16:30-16:50  | SE2                     | Effect of microstructure on wear behaviour of aluminium 2014 (Al2014)<br><i>Shubrajit Bhaumik, Viorel Paleu, Dhruvajyoti Chowdhury, Cornelia Cîrlan Paleu and Shubhabrata Datta</i><br>ROMANIA   |          |
| 16:50-17:10  | SE3                     | Temperature influence on mechanical properties of chromium nitride thin films<br><i>Florina Şerdean, Violeta Merie, Gavril Negrea, Corina Bîrleanu and Ionuţ Mărieş</i><br>ROMANIA   |          |
| 17:10-17:30  | SE4                     | Technological and structural analysis of Al <sub>2</sub> O <sub>3</sub> 40TiO <sub>2</sub> coating deposited on a shaft sleeve of hydraulic pump<br><i>Cornelia Cîrlan Paleu, Bogdan Istrate, Viorel Paleu and Corneliu Munteanu</i><br>ROMANIA        |          |
| 17:30-17:50  | SE5                     | Friction and wear resistance of Al <sub>2</sub> O <sub>3</sub> 40TiO <sub>2</sub> (AMDRY6250) coating of a pump shaft sleeve bearing<br><i>Viorel Paleu, Cornelia Cîrlan Paleu, Bogdan Istrate, Shubrajit Bhaumik and Corneliu Munteanu</i><br>ROMANIA |          |
| 17:50-18:00  | <b>Closing Ceremony</b> |  |          |

**DAY 3 - SEPTEMBER 21, 2019**

**CONFERENCE TRIP TO FIZESULUI  
VALLEY**





# ROTRIB 2019

## SPONSORS

|  |   |
|--|---|
|  <p><b>lubricants</b><br/>an Open Access Journal by MDPI</p> <p>MDPI AG<br/>www.mdpi.com/journal/lubricants<br/>www.mdpi.com</p>  | <p><b>Lubricants</b> (ISSN 2075-4442) is an international scientific open access journal, covers all aspects of tribology, including the study and application of the principles of friction, lubrication and wear. This journal is indexed in ESCI-Web of Science (WOS) and Scopus (CiteScore 1.87), Polymer Library, etc.<br/>*Q1* in Mechanical Engineering (SJR, 2018); *Q2* in Mechanical Engineering (Scopus, 2018); *Q2* in Surfaces, Coatings and Films (Scopus, 2018)<br/>Address: St. Alban-Anlage 66, 4052 Basel, Switzerland<br/>Phone: +41 61 683 77 34; email: lubricants @ mdpi.com<br/>Contact person: Ms. Jasmine Xu</p>   |
|  <p>Schaefer SouthEast Europe SRL<br/>www.schaefer-tec.ro</p>  | <p>As regional distributor for KLA, USA we offer a complete portfolio of high-throughput nanomechanical testers for material characterization and process control needs. With flexible add-on and upgrade options, our nanoindenter systems can be used for a wide range of nano-scale measurements, including hardness, modulus and adhesion.<br/>Take the measurement to the next level, starting with step height, texture and stress analysis also with the help of KLA contact or optical profilers.<br/>Address: KLA Corporation-One Technology Drive, Milpitas, California 95035, US<br/>Phone: +40 733944144 (local contact)<br/>Contact person: Claudia Moldovan, email: moldovan @ schaefer-tec.com</p> |
|  <p>SC TECHNO VOLT SRL<br/>www.technovolt.ro</p>  | <p><b>TECHNO VOLT</b>, founded in 1999, provides equipment and complete laboratories for all fields of technical education and research, solutions and products for industrial applications, electrical power quality, metrology.<br/>Address: Bd. Constructorilor nr. 20A, sect. 6, 060512, Bucuresti, Romania<br/>Phone: 021 220 1302; Fax:021 2210925<br/>Contact person: Gabriela Ploesteanu, gploesteanu @ technovolt.ro</p>   |
|  <p>TTZH Tribologie &amp; Hochtechnologie GmbH<br/>www.ttzh.de</p>  | <p><b>TTZH</b> was founded in 2004 as a private engineering company. It provides equipment for tribotesting and characterisation of engineered surfaces, bulk materials, lubricating oils and greases, technology and equipment for deposition of PVD tribological coatings and related technical services, consumables and components.<br/>Address: Bärenhof 26A, D-30823 Garbsen, Germany<br/>Phone: +49 5137 825902; Fax: +49 5137 825963<br/>Contact person: Dr. Alexander Minewitsch, alexander.minewitsch @ ttzh.de</p>   |
|   <p>S.C. ROFAROM SRL<br/>www.rofarom.ro</p> | <p>The company was founded in 1992, as a partner with ROFA Labor &amp; Prozessanalytik Wien. <b>ROFAROM</b> is the exclusive distribution partner of Anton Paar in Romania, with extensive experience in quality control equipment. Anton Paar develops, produces, distributes, and provides support for analytical instruments used in research, development, and quality control worldwide.<br/>In 2006, ROFAROM met the requirements of ISO 9001: 2008, quality management and control for import, sales, installation and service of industrial laboratory equipment.<br/>Address: Miercurea Ciuc, 530213, Romania<br/>Phone: +40266371629<br/>Contact person: Istvan Albert, email: office@rofarom.ro</p>    |

|  |  |
|--|--|
|  <p>S.C POWER BELT SRL<br/>www.powerbelt.ro</p>   | <p>The company <b>Power Belt SRL</b> was founded in <b>1999</b> with entirely private invested capital and started commercial operations on the drive belts market. Since the establishment, our product range has gradually and continuously developed so that presently we offer a wide range of mechanical drive technology products and other industrial spare parts. Our premises in Romania are located in Cluj and Bucharest and we are a key player on the Romanian mechanical transmission and industrial supplies market. The close cooperation with the other companies of the Power Belt group (Hungary, Slovakia, Ukraine) and the regular shipments facilitate our partners' easy access to all our products and services.</p> <p>Address: B-dul. Muncii nr. 277, Cluj-Napoca, Romania<br/>Phone: + 40 264 432448, Fax: +40 264 334311<br/>Contact person: Eng Arpad Turos. email: office@powerbelt.ro</p> |
|  <p>Micromatic SRL<br/>www.micromatic.com.ro</p>  | <p><b>Micromatic</b> is focused on providing turnkey systems and services in industrial automation. Since its establishment in 2005, the company aims to provide state of the art automation systems as well as flexible engineering services and solutions.</p> <p>Address: Str. Tabacarilor 2, RO-400139 Cluj-Napoca, Romania<br/>Contact: Florin PANAZAN, <a href="mailto:office@micromatic.ro">office@micromatic.ro</a>, +40-743-328192</p>  |
|  <p>Chem Trend Romania SRL<br/>www.chemtrend.com</p>  | <p><b>Chem-Trend</b> is the most proven partner in the world for release agents, purging compounds, and other process chemical specialties. Using a customer-centric approach and deep research and development, we are here to help you become more efficient. More productive. And more sustainable. Since our founding, Chem-Trend has been focused on a better way. With R&amp;D facilities around the world, we are improving the future of manufacturing</p> <p>Address: Str Autogarii nr 1 , Sibiu , Romania<br/>Phone: +40 377 702134 Fax: 0040 377 702 153<br/>Contact person: Dr.Ing. Vasile Kicsi, email: v.kicsi@yahoo.com</p>   |
|  <p>VGA Die Cast Solutions SRL<br/>www.vgadiecastsolutions.com</p>  | <p><b>VGA DIE CAST SOLUTIONS</b> was founded after 10 years of experience in Die Casting, following the project which started in 2014 with producers of die casting equipment and technology: ITALPRESSE, IECI, BRONDOLIN, WOLLIN and INPROTEC IRT, in partnership with one of the most efficient aluminium casting company in Romania.VGA DIE CAST SOLUTIONS offers you support and training for the acquired products guaranteeing their efficiency in the production of cast aluminium parts.</p> <p>Address: Str Careiului nr34/111 , Satu Mare , Romania<br/>Phone: +40 744 959839<br/>Contact person: Ing. Nicolae Boca, email: nicu.boca@vgadiecastsolutions.com</p>  |
|  <p>Asociația Română de Transmisii<br/>Mecanice<br/><a href="http://www.roamet.pub.ro">http://www.roamet.pub.ro</a></p> | <p><b>The Romanian Mechanical Transmission Association (ROAMET)</b> is a non-profit, non-governmental, independent, apolitical, scientific and professional organization, part of civil society.</p> <p>Address: 13 Splaiul Independentei, CG 119, 060042 Bucuresti, ROMANIA<br/>Phone: +40 21 402 9411<br/>Fax:+40 21 402 9411<br/>Contact person: Prof.Dr.Eng. Sorin Cananau, Email: roamet16@yahoo.com; s_cananau@yahoo.com</p>   |
|  <p>S.C. Spectromas SRL<br/><a href="http://spectromas.ro">http://spectromas.ro</a></p>                                 | <p>Founded in 2003, <b>SPECTROMAS</b>, in the more than 15 years of experience, was dedicated to providing its customers with products and services of the highest quality, the actions carried out not only satisfying the clients but also anticipating their needs.</p> <p>Address: Str. Saturn nr. 2A, 400504, Cluj-Napoca, ROMANIA<br/>Phone:+40 264 588378, 0722-365821<br/>Fax:+40 264 588378<br/>Contact person: Eng. Dragos Muntean, Email: sales.cluj@spectromas.ro</p>  |

# ROTRIB '19

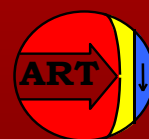
## - contact info -

**Technical University of Cluj-Napoca**  
Faculty of Machine Building  
Micro - Nano Systems Laboratory  
Bd. Muncii 103-105  
Cluj-Napoca  
Romania

**Tel:** +40 264 202 787 (Marius PUSTAN)  
**Fax:** +40 264 202 787  
**E-mail:** [rotrib.2019@omt.utcluj.ro](mailto:rotrib.2019@omt.utcluj.ro)  
**Web site:** <https://minas.utcluj.ro/rotrib2019>



**TECHNICAL UNIVERSITY**  
OF CLUJ-NAPOCA



**MiNaS**

Micro-Nano Systems Laboratory