Overview

Wednesday, May 19, 2021

8:30 – 10 am
Wednesday Keynote Session

Keynote Speaker:
• Dr. Armit Parikh, Research Manager, Smith & Nephew, Inc.

10 – 10:30 am
Networking Break & Special Programming

10 am – 3:30 pm
Virtual Exhibits and Student Posters

10:30 am – 1 pm
Wednesday Technical Sessions:
• 5A – Biotribology I
• 5B – 2D Materials/Superlubricity: Material Tribology & Nanotribology Joint Session II
• 5C – Engine & Drivetrain I
• 5D – Lubrication Fundamentals II: Additives I
• 5E – Wear I
• 5F – Tribotesting I
• 5G – Rolling Element Bearings III
• 5H – Nonferrous Metals III
• 5I – Commercial Marketing Forum V

1 – 2 pm
Plenary Program – Session #1

Plenary Speaker:
• Dr. Jack Zakarian, Consultant, JAZTech Consulting LLC

2 – 6 pm
Wednesday Technical Sessions:
• 6A – Biotribology II
• 6B – 2D Materials/Superlubricity: Material Tribology & Nanotribology Joint Session II
• 6C – Engine & Drivetrain II
• 6D – Lubrication Fundamentals III: Additives II
• 6E – Wear II
• 6F – Tribotesting II
• 6G – Rolling Element Bearings IV
• 6H – Tribochemistry – Materials Tribology & Nanotribology Joint Session I
• 6I – Grease I
• 6J – Commercial Marketing Forum V1

3 – 3:30 pm
Networking Break & Special Programming

Trade Show Hours:
• Monday, May 17: 10 am – 4 pm
• Tuesday, May 18: 10 am – 3:30 pm
• Wednesday, May 19: 10 am – 3:30 pm
• Thursday, May 20: 10 am – 3:30 pm
(All times listed are Eastern Daylight Time)
### Technical Sessions Time Grids – Wednesday, May 19, 2021

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<tr>
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<td>Development and Demonstration of a Prototype 0W-20 Heavy Duty Diesel Engine Oil, J. Pettingill, p. 52</td>
<td>Engine Efficiency Testing on Aggregated Textured Components, S. Hsu, p. 52</td>
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**SESSION 5G**
Rolling Element Bearings III

**SESSION 5H**
Nonferrous Metals III

**SESSION 5I**
Commercial Marketing Forum V

**SESSION 6G**
Rolling Element Bearings IV

**SESSION 6H**
Tribochemistry I

**SESSION 6I**
Grease I

**SESSION 6J**
Commercial Marketing Forum VI
Ergon Delivers

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5A • Virtual Meeting Room 1
BIOTRIBOLOGY I
Session Chair: Angela Pitenis, University of California, Santa Barbara, CA
10:30 – 11 am
3499561: Impact of Metal Release on Chondrocytes Due to Biotribocorrosion in CoCrMo Sliding Against Articular Cartilage
Manel Rodriguez Ripoll, Bojana Simlinger, Friedrich Franek, AC2T research GmbH, Wiener Neustadt, Austria; Christoph Bauer, Christoph Stotter, Thomas Klestil, Stefan Nehrer, Danube University Krems, Krems, Niederösterreich, Austria

11 – 11:30 am
3490856: Experimental Biotribological Testing of Hydrogels and Articular Cartilage for Medical Engineering Applications
Paul Staudinger, Anton-Paar GmbH, Graz, Austria; Florian Rummel, Anto Paar Germany GmbH, Ostfildern, Germany; Kartik Pondicherry, Anton Paar India, Hyderabad, India; Dominique Felk, Tuebingen University, Tuebingen, Germany

11:30 am – Noon
INVITED TALK
Peter Lee, Gregory Hansen, Carlos Sanchez, Southwest Research Institute, San Antonio, TX

Noon – 12:30 pm
3484432: A New Method to Evaluate Compression, Adhesion and Thread Formation (Tackiness) in Biomedical and Healthcare Products
Emmanuel Georgiou, Falex Tribology NV, Rotselaar, Belgium; Olaf Mollenhauer, Kompass Sensor GmbH, Ilmenau, Germany; Dirk Drees, Falex Tribology NV, Rotselaar, Belgium

5B • Virtual Meeting Room 2
2D MATERIALS/ SUPERLUBRICITY
Materials Tribology & Nanotribology Joint Session II
Session Chair: Kora Farokhzadeh, Bruker Nano Surfaces, San Jose, CA
Session Vice Chair: Mohammad Vazirisereshk, University of California Merced, Merced, CA
10:30 – 11:30 am
INVITED TALK
3565696: The Fascinating Frictional Properties of Layered Materials
Michael Urbakh, Tel Aviv University School of Chemistry, Tel Aviv, Israel

11:30 am – Noon
3501572: Robust Vibration Induced Lubricity
Arnab Bhattacharjee, Nikolay Garabedian, David Burris, University of Delaware, Newark, DE

Noon – 1 pm
INVITED TALK
3570304: 2D Materials as Solid Lubricants: Ab Initio Comparative Study of Tribochemical, and (Super)Lubric Properties
M. Clelia Righi, Universita di Bologna, Bologna, Emilia-Romagna, Italy

5C • Virtual Meeting Room 3
ENGINE AND DRIVETRAIN I
Session Chair: William Anderson, Afton Chemical Corp., Richmond, VA
10:30 – 11 am
3483460: Component Wear in Diesel Engine High Pressure Fuel Pumps Operating with Heavy Fuel
Nikhil Murthy, Blake Johnson, CCDC Army Research Laboratory, Aberdeen Proving Ground, MD; Caleb Matzke, University of North Dakota, Grand Forks, ND; Stephen Berkebile, Army Research Laboratory, Aberdeen Proving Ground, MD

11 – 11:30 am
Peter Lee, Gregory Hansen, Carlos Sanchez, Southwest Research Institute, San Antonio, TX

Noon – 12:30 pm
3493035: Development and Demonstration of a Prototype 0W-20 Heavy Duty Diesel Engine Oil
John Pettingill, Petro-Canada Lubricants Inc, Mississauga, Ontario, Canada

12:30 – 1 pm
3497070: Engine Efficiency Testing on Aggregated Textured Components
Stephen Hsu, Govindaiah Patakamuri, George Washington University, Germantown, MD; Timothy Cushing, General Motors Corp., Detroit, MI

5D • Virtual Meeting Room 4
LUBRICATION FUNDAMENTALS II: ADDITIVES I
Session Chair: Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN
Session Vice Chair: Nicole Doerr, AC2T Research GmbH, Wiener Neustadt, Austria
10:30 – 11 am
3497203: Tribochemistry – Past, Present, and Future
Stephen Hsu, GWU, Germantown, MD

11 – 11:30 am
3493035: Development and Demonstration of a Prototype 0W-20 Heavy Duty Diesel Engine Oil
John Pettingill, Petro-Canada Lubricants Inc, Mississauga, Ontario, Canada

Noon – 12:30 pm
3491151: The Mechanics of Single Cross-Links which Mediate Cell Attachment at a Hydrogel Surface
Nikhil Murthy, Blake Johnson, CCDC Army Research Laboratory, Aberdeen Proving Ground, MD; Caleb Matzke, University of North Dakota, Grand Forks, ND; Stephen Berkebile, Army Research Laboratory, Aberdeen Proving Ground, MD

12:30 – 1 pm
3497070: Engine Efficiency Testing on Aggregated Textured Components
Stephen Hsu, Govindaiah Patakamuri, George Washington University, Germantown, MD; Timothy Cushing, General Motors Corp., Detroit, MI
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### WEAR I

**Session Chair:** Yan Zhou, Houghton International, Oak Ridge, TN  
**Session Vice Chair:** John Bomidi, Baker Hughes Company, The Woodlands, TX

#### 10:30 – 11 am
3479342: Fretting Wear in Contacts Representative of Wire Rope Internal Interfaces: The Influence of Key Lubrication Parameters  
Christopher Dyson, William Hopkins, Michael Cassidy, ITW ROCOL, Leeds, West Yorkshire, United Kingdom; Richard Chittenden, University of Leeds, Leeds, West Yorkshire, United Kingdom; Martin Priest, Malcolm Fox, University of Bradford, Bradford, West Yorkshire, United Kingdom

#### 11 – 11:30 am
3483644: Comparing Afton’s Bespoke Stick Slip Rig with the Former Cincinnati Milacron Rig  
Ralph Lumby, Afton Chemical Ltd., Bracknell, United Kingdom

#### Noon – 12:30 pm
3476697: Developing an Innovative Next Generation Anti-Wear  
Christelle Chretien, SOLVAY, Bristol, PA  

#### 12:30 – 1 pm
3565800: Suppressed Triboluminescence Attributed to Electron Structure Changes in the Doped Surface  
Changhui Song, Liran Ma, Jianbin Luo, Tsinghua University, Beijing, China

### WEAR II

**Session Chair:** Christopher DellaCorte, NASA, Cleveland, OH  
**Session Vice Chair:** Ashish Kasar, University of Nevada Reno, Reno, NV

#### 10:30 – 11 am
3479342: Fretting Wear in Contacts Representative of Wire Rope Internal Interfaces: The Influence of Key Lubrication Parameters  
Christopher Dyson, William Hopkins, Michael Cassidy, ITW ROCOL, Leeds, West Yorkshire, United Kingdom; Richard Chittenden, University of Leeds, Leeds, West Yorkshire, United Kingdom; Martin Priest, Malcolm Fox, University of Bradford, Bradford, West Yorkshire, United Kingdom

#### 11 – 11:30 am
3483644: Comparing Afton’s Bespoke Stick Slip Rig with the Former Cincinnati Milacron Rig  
Ralph Lumby, Afton Chemical Ltd., Bracknell, United Kingdom

#### Noon – 12:30 pm
3499299: Reconditioning Lubricating Oils: The Tribological Performance Perspective  
Arnaud Ruellan, Aldara Naveira-Suarez, SKF Group, Goteborg, Sweden

#### 12:30 – 1 pm
3484933: Electric Current Effects on Wind Turbine Bearing Steel: Test Rig and Results  
Robert Erck, Benjamin Gould, Nicholas Demas, Aaron Greco, Argonne National Laboratory, Lemont, IL

### WEAR III

**Session Chair:** Hannes Grillenberger, Schaeffler Technologies AG and Co KG, Herzogenaurach, Germany

#### 11 – 11:30 am
3483981: A Mechanistic Approach to Understand Rolling Contact Fatigue (RCF) Induced Microstructural Alterations  
Muhammad Abdullah, Zulfiqar Khan, Bournemouth University, Bournemouth, Dorset, United Kingdom; Wolfram Kruhoeffer, Schaeffler Technologies AG und Co KG, Herzogenaurach, Bayern, Germany

#### 11:30 am – Noon
3489226: Mechanistic Study of White Etching Bands Formation in Bearing Steel Due to RCF  
Mostafa El Laithy, Ling Wang, Terry Harvey, University of Southampton, Southampton, Hampshire, United Kingdom; Bernd Vierneusel, Schaeffler Technologies AG and Co KG, Schweinfurt, Germany

#### Noon – 12:30 pm
3495122: Fracture-Mechanical Evaluation of Inclusions – Comparison with Test Results  
Joerg Binderzewsky, Wolfram Kruhoeffer, Toni Blass, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany

#### 12:30 – 1 pm – Rolling Element Bearings Business Meeting
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NONFERROUS METALS III

Session Chair: Tom Oleksiak, Quaker Houghton, Acworth, GA

10:30 – 11 am
3485144: Structure-Performance Evaluation of Synthetic Metalworking Fluid Additives
Tiffany Meyers, Stephanie Cole, Clariant, Mount Holly, NC

11 – 11:30 am
3476767: Chemistry Behind Settling Metal Fines in Aqueous Metalworking Fluids
Stefanie Velez, Münzing Chemie GmbH, Bloomfield, NJ

COMMERCIAL MARKETING FORUM V

10:30 – 11 am – Functional Products
3577954: Introducing V-705, a New and Unique Synthetic Basestock for Automotive and Industrial Applications
Gavin Duckworth

11 – 11:30 am – ANGUS Chemical Co.
3577794: Benefits of CORRGUARD™ Additives in Metalworking Fluid Formulations and Beyond
Min Chen

11:30 am – Noon – King Industries
3578764: NA-LUBE KR Alkylated Naphthalenes for High Temperature Application
Amanda Harris

BIOTRIBOLOGY II

Session Chair: Alison Dunn, University of Illinois, Urbana, IL

2 – 2:30 pm
3483667: Acoustic Emission Signals as a Diagnostic Tool for Joint Wear
Khadijat Olorunlambe, Zhe Hua, Duncan Shepherd, Karl Dearn, University of Birmingham, Birmingham, United Kingdom

2:30 – 3 pm
3499235: Wear of Antibacterial Coatings on CoCrMo Under Butterfly Motion and Dynamic Loads in a Biotribometer
Deepak Halenahally Veeregowda, Angela Maria Tortora, Ducom Instruments, Groningen, Netherlands

3 – 3:30 pm – Break

3:30 – 4 pm
3515762: Oral Tribology, Lubrication and Adsorption of Alternative Food Proteins
Ben Kew, Anwesha Sarkar, Melvin Holmes, University of Leeds, Leeds, Yorkshire, United Kingdom

4 – 4:30 pm
3512880: Soft Matter Tribology in Biology
Angela Pitenis, Allison Chau, Jonah Rosas, George Degen, University of California, Santa Barbara, Santa Barbara, CA

4:30 – 5 pm – Biotribology Business Meeting

2D MATERIALS/SUPERLUBRICITY

Materials Tribology & Nanotribology Joint Session III

Session Chair: Azhar Vellore, Martini Research Group, University of California, Merced, Merced, CA

Session Vice Chair: Mohammad Vazirisereshk, University of California, Merced, Merced, CA

2 – 2:30 pm
3499763: Phase Transitions in Alkanes Confined at Graphitic Interface
Prashima Nalam, Behnoosh Sattari Baboukani, SUNY University at Buffalo, Buffalo, NY; Zhijiang Ye, Miami University, Oxford, OH

2:30 – 3 pm
3492606: Nanotribology of 2D Transition Metal Dichalcogenides: The Effect of Chalcogen Variation on Frictional Behavior of MoS2, MoSe2 and MoTe2
Mohammad Vazirisereshk, Ashlie Martini, University of California Merced, Merced, CA; Kathryn Haz, Robert Carpick, University of Pennsylvania, Philadelphia, PA

3 – 3:30 pm – Break

(State starts at 4 pm)

4 – 4:30 pm
3484804: Contact Aging in Structural Superlubricity
Wai Oo, Mehmet Baykara, University of California, Merced, Merced, CA

4:30 – 5 pm
3484587: Inverse Layer Dependence of Friction on Chemically Doped MoS2
Mehmet Baykara, Ogulcan Acikgoz, University of California, Merced, Merced, CA; Aipar Yanilnaz, Cem Celebi, Izmir Yusuf Teknoloji Enstitusu, Izmir, Turkey; Omar Dagdeviren, McGill University, Montreal, Quebec, Canada
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6B | 2D Materials/Superlubricity (con’t)

5 – 5:30 pm
3498096: Why is Friction at the Graphene Step Edge So High While Friction on the Basal Plane is So Low?
Zhe Chen, Seong Kim, Pennsylvania State University, University Park, PA

6C • Virtual Meeting Room 3
ENGINE AND DRIVETRAIN II
Session Chair: Hamed Ghadnia, Gehring Group, Farmington Hills, MI

2 – 2:30 pm
3482399: The Effect of Engine Oil and Lubrication System Design on Engine Friction as Demonstrated in a Motored Engine
William Anderson, Kongsheng Yang, Zhang Yun, Sha Yang, Afton Chemical Corp., Richmond, VA; Yuelei Ding, Pan Asia Technical Automotive Center Co. Ltd., Pudong, Shanghai, China

2:30 – 3 pm
3484731: Friction and Wear of Thermal Spray Coatings for Cylinder Bores
Arup Gangopadhyay, Cliff Maki, Larry Elie, Robert Zdrodowski, Zhiqiang Liu, Urban Morawitz, Ford Motor Company, Dearborn, MI; Hamed Ghadnia, Gehring Group, Farmington Hills, MI; Joachim Patschull, Ford Motor Company (Retired), Cologne, Germany

3 – 3:30 pm – Break

3:30 – 4 pm
3499847: Benchtop Test for Screening Wet Clutch Materials
Carlos Sanchez, Southwest Research Institute, San Antonio, TX

4 – 4:30 pm
3484474: Road to Ultra-Low Viscosity 0W Oils: Quantifying Frictional Benefits on the Journal Bearing Machine
Priyanka Desai, Shell Global Solutions (US) Inc., Houston, TX; Konstantinos Kalogiannis, Omar Mian, MAHLE Engine Systems UK Ltd., Rugby, United Kingdom; Francesco Manieri, Tom Reddyhoff, Imperial College London, London, United Kingdom; Robert Mainwaring, Shell Global Solutions UK, London, United Kingdom

4:30 – 5 pm – Engine and Drivetrain Business Meeting

6D • Virtual Meeting Room 4
LUBRICATION FUNDAMENTALS III: ADDITIVES II
Session Chair: Brendan Miller, Chevron Oronite Co., Richmond, CA
Session Vice Chair: Stephen Hsu, George Washington University, Germantown, MD

2 – 2:30 pm
3497165: Engine Test of Microencapsulated Friction Modifier Additives for Fuel Economy Enhancement
Stephen Hsu, Govindaiah Patakamuri, George Washington University, Germantown, MD

2:30 – 3 pm
3497186: Fuel Economy Improvement Using Ultralow Viscosity Lubricants
Stephen Hsu, Govindaiah Patakamuri, GWU, Germantown, MD; Timothy Cushing, General Motors Corp., Detroit, MI

3 – 3:30 pm – Break

3:30 – 4 pm
3478919: Tuned Polar Methacrylate Viscosity Index Improvers for Enhanced Shear Stability and Wear Prevention
Lelia Cosimbescu, Kristen Campbell, Mia Song, Dongsheng Li, Marie Swita, Pacific Northwest National Laboratory, Richland, WA; Robert Erick, Argonne National Laboratory, Lemont, IL

4 – 4:30 pm
3499618: Exploring New and Innovative Additives for Extreme Tribological (ET) Performance
Liwen Wei, Novitas Chem Solutions, Houston, TX

4:30 – 5 pm
3483942: Investigation on the Superlubricity and Nanomechanics of Liposome Adsorption on Titanium Alloys
Yuhong Liu, Tsinghua University, Beijing, China

5 – 5:30 pm
3483490: The Importance of Tribology in Climate Discussions and for Sustainability Goals
Mathias Woydt, MATRILUB, Berlin, Germany

5:30 – 6 pm – Lubrication Fundamentals Business Meeting
PRESENTING AT THE
2021 STLE ANNUAL MEETING
“Reviewing the Performance of Permanently Suspended Nanocarbons in Lubricants”

When: Monday, May 17, 2021
Where: Virtual Meeting Room #6
Time: 4:00pm to 4:30pm EST
Session: Nanotribology II
2021 STLE Virtual Annual Meeting & Exhibition
TECHNICAL SESSIONS | Wednesday, May 19, 2021

6E • Virtual Meeting Room 5
WEAR II
Session Chair: Ali Beheshti, George Mason University, Fairfax, VA

2 – 2:30 pm
3541859: Effects of Lubricant Additives on Fretting Wear
Artemis Kontou, Hugh Spikes, Imperial College London, London, United Kingdom; Ian Taylor, Shell Global Solutions UK, London, Cheshire West and Chester, United Kingdom

2:30 – 3 pm
3519346: Friction and Surface Interaction Analysis of PDC on Granite and Carbonate Rocks
John Bomidi, Chengjiao Yu, Marc Bird, Baker Hughes Company, The Woodlands, TX; Maria Cinta Lorenzo Martin, Oyelayo Ajayi, Argonne National Laboratory, Lemont, IL

3 – 3:30 pm – Break

3:30 – 4 pm
3486651: A Review of Tribological and Surface Behavior of MAX Phase-Based Composites
Surojit Gupta, Mahashri Dey, Sabah Javed, Caleb Matzke, University of North Dakota, Grand Forks, ND; Nikhil Murthy, CDC Army Research Laboratory, Aberdeen Proving Ground, MD; Stephen Berkebile, Army Research Laboratory, Aberdeen Proving Ground, MD

4 – 4:30 pm
3499215: Repeatability of Friction and Wear of Different Material Pairs at 1000°C under Unidirectional Sliding Motion
Debdutt Patro, Harish Prasanna, Sravan Kumar Josyula, Angela Maria Tortora, Fabio Alemanno, Deepak Halansahally Veeravigoda, Ducom Instruments, Groningen, Netherlands

4:30 – 5 pm
3498960: Elevated Temperature Fretting Wear Study of Additively Manufactured Inconel 625 with Varying Process Parameters
Manisha Tripathy, Ali Beheshti, George Mason University, Fairfax, VA; Keivan Davami, The University of Alabama, Tuscaloosa, AL

5 – 5:30 pm
3580118: Statistical Considerations in Wear Scar Measurement in Antifriction Coatings
Melissa Mushrush, DuPont de Nemours Inc, Wilmington, DE; Kevin Wier, Dow Chemical Co, Midland, MI

5:30 – 6 pm – Wear Business Meeting

6F • Virtual Meeting Room 6
TRIBOTESTING II
Session Chair: Daulton Isaac, Air Force Research Laboratory, Wright Patterson AFB, OH
Session Vice Chair: Alessandro Ralls, University of Nevada Reno, Reno, NV

2 – 2:30 pm
34973453: Testing for Friction Differences Between Oils
Kenneth Budinski, Bud Labs, Rochester, NY

3 – 3:30 pm – Break

3:30 – 4 pm
3481715: Wear and Viscosity Effects of Mineral Oil Dilution by Biodiesels and their Methyl Esters
Gustavo Molina, John Morrison, Emeka Onyejizu, Valentin Soloiu, Georgia Southern University, Statesboro, GA

4 – 4:30 pm
3484531: Extracting More Value From Tribofilm Images
Oluwaseyi Ogunosu, Shell Global Solutions USA Inc., Houston, TX; Chaitanya Pradan, Aarthi Thyagarajan, Vishal Ahuja, Shell India Markets Private Limited, Bengaluru, Karnataka, India

4:30 – 5 pm
3522420: Advanced Capacitance Sensors for Tribological Characterization of Superlubricity Conditions
Tushar Khosla, Jun Xiao, Nick Doe, Rtec-Instruments, San Jose, CA; Pradeep Menezes, University of Nevada Reno, Reno, NV

5 – 5:30 pm
3479016: Synergistic Action of Friction Modifier (MoDTC) with PTFE NPs as an Additive
Vinay Saini, Jayashree Bijwe, IIT Delhi, Delhi, India

5:30 – 6 pm – Tribotesting Business Meeting
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- Piston pin
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- ASTM D8316-20
- ASTM D5706-16

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### 6G • Virtual Meeting Room 7
#### ROLLING ELEMENT BEARINGS IV

**Session Chair:** Bryan Allison, SKF Aeroengine, Clymer, NY

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Speaker(s)</th>
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</thead>
<tbody>
<tr>
<td>2 – 2:30 pm</td>
<td>3543554: Influence of Vibration Induced Standstill Marks (Fretting) on Bearings of E-drives</td>
<td>Markus Grebe, Hochschule Mannheim, Mannheim, Germany</td>
</tr>
<tr>
<td>2:30 – 3 pm</td>
<td>3483088: Numerical Modeling of Three-Dimensional Crack Propagation Under Rolling Contact Fatigue</td>
<td>Florian Meray, Daniel Nellas, Anthony Gravouil, Thibaut Chaise, Univ Lyon, INSA-Lyon, CNRS, LaMCoS, Villeurbanne, France; Bruno Descharrieres, Airbus Helicopters, Aéroport International Marseille Provence, Marignane, France</td>
</tr>
<tr>
<td>3 – 3:30 pm</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>4 – 4:30 pm</td>
<td>3498567: Propagation of Rolling Contact Fatigue Cracks in Ball Bearing</td>
<td>Kenji Matsumoto, Honda Research and Development Japan Inc, Tochigi, Takanawa, Tokyo, Japan; Naoki Yoshida, Kyoju University, Kasuga, Fukushima, Japan; Akira Sasaki, Maintek Consulting, Yokohama, Kanagawa, Japan</td>
</tr>
<tr>
<td>4:30 – 5 pm</td>
<td>3484977: Dependence of Tribological Performance and Tribopolymerization on the Surface Binding Strength of Selected Cycloalkane-Carboxylic Acid Additives</td>
<td>Qianga Ma, Arman Mohammad Khan, Q. Jane Wang, Yip-Wah Chung, Northwestern University, Evanston, IL</td>
</tr>
</tbody>
</table>

### 6H • Virtual Meeting Room 8
#### TRIBOCHEMISTRY
**Materials Tribology & Nanotribology Joint Session I**

**Session Chair:** Mark Sidebottom, Miami University, Oxford, OH

**Session Vice Chair:** Mary Makowiec, Pratt & Whitney, East Hartford, CT

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<tr>
<th>Time</th>
<th>Presentation</th>
<th>Speaker(s)</th>
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</thead>
<tbody>
<tr>
<td>2 – 2:30 pm</td>
<td>3498014: Wear Penalty for Steel Rubbing Against Hard Coatings in Reactive Lubricants</td>
<td>Xin He, Harry Meyer, Huimin Luo, Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN</td>
</tr>
<tr>
<td>2:30 – 3 pm</td>
<td>3498032: Investigation of Friction and Wear Behavior in Chloride Molten Salt for Concentrating Solar Power Pump Bearings</td>
<td>Xin He, Rick Wang, Dino Sulejmanovic, James Keiser, Kevin Robb, Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN</td>
</tr>
<tr>
<td>3 – 3:30 pm</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30 – 4 pm</td>
<td>3485147: Tribological Behavior of PS400-Related Tribopairs for Space Exploration</td>
<td>Vasilis Tsikitis, Kian Bashandeh, Andreas Polycarpou, Texas A&amp;M University, College Station, TX; Pissiang Lan, ATSP Innovations, Champaign, IL</td>
</tr>
<tr>
<td>4 – 4:30 pm</td>
<td>3485317: Development of Self-Adaptive Lubricating Silver Aluminum Borate Composite for Wide Temperature Range</td>
<td>Ashish Kasar, Pradeep Menezes, University of Nevada, Reno, Reno, NV</td>
</tr>
<tr>
<td>4:30 – 5 pm</td>
<td>3484977: Dependence of Tribological Performance and Tribopolymerization on the Surface Binding Strength of Selected Cycloalkane-Carboxylic Acid Additives</td>
<td>Qianga Ma, Arman Mohammad Khan, Q. Jane Wang, Yip-Wah Chung, Northwestern University, Evanston, IL</td>
</tr>
</tbody>
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### 6I • Virtual Meeting Room 9
#### GREASE I

**Session Chair:** Kuldeep Mistry, The Timken Company, North Canton, OH

**Session Vice Chair:** Cindy Liu, Klüber Lubrication NA, LP, Londonderry, NH

<table>
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<tr>
<th>Time</th>
<th>Presentation</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>2 – 2:30 pm</td>
<td>3532329: Fully Customizable Calcium Sulfonate Greases for Optimum Performances</td>
<td>Marie Legatte, Guillaume Nothes, SEQENS, Porcheville, France</td>
</tr>
<tr>
<td>2:30 – 3 pm</td>
<td>3484679: Adhesion and Tackiness of Greases: From Concept to an ASTM Standard Method</td>
<td>Emmanuel Georgiou, Dirk Dees, Michel De Bilde, Falex Tribology NV, Rotselaar, Belgium; Michael Anderson, Falex Corporation, Sugar Grove, IL; Satish Achanta, ASML Netherlands BV, Veldhoven, North Brabant, Netherlands; Manfred Jungk, MJ Tribology, Geisenheim, Germany</td>
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<tr>
<td>3 – 3:30 pm</td>
<td>Break</td>
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<tr>
<td>3:30 – 4 pm</td>
<td>3480662: New Method to Measure Grease Tackiness and Comparison with Water Resistance and Low-Temperature Mobility</td>
<td>Anoop Kumar, Chevron Lubricants, Richmond, CA</td>
</tr>
<tr>
<td>4 – 4:30 pm</td>
<td>3473181: Back to the Basics – Part II: Fundamental Building Blocks of Grease Formulation – The Next Story</td>
<td>Joseph Kaperick, Afton Chemical Corporation, Richmond, VA</td>
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</tbody>
</table>

### 6J • Virtual Meeting Room 10
#### COMMERCIAL MARKETING FORUM VI

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Vendor or Company</th>
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<td>2 – 2:30 pm</td>
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<tr>
<td>3 – 3:30 pm</td>
<td>Break</td>
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