ADVANCE PROGRAM

REGISTER BEFORE APRIL 27 AND SAVE $100!

stle ATLANTA

STLE

72nd Annual Meeting & Exhibition

May 21-25, 2017
Hyatt Regency Atlanta
Atlanta, Georgia (USA)

Society of Tribologists and Lubrication Engineers
840 Busse Highway, Park Ridge, Illinois (USA) 60068 • www.stle.org • #STLE2017

Message from the Chair

STLE's Annual Meeting offers the lubricant industry's premier technical training

Dear Industry Professional,

I'd like to extend a personal invitation to join me for STLE's 72nd Annual Meeting & Exhibition, May 21-25, 2017, at the Hyatt Regency Atlanta in Atlanta, Georgia. Start making plans now to engage with more than 1,600 of your peers in the field of tribology and lubrication engineering from around the world who will be participating in an extraordinary combination of technical presentations, education courses, exhibits and related business and social activities.

The society's Annual Meeting is always at the top of the list of benefits derived from STLE membership, and this year's program looks to be stronger than ever. There will be a wealth of information and business contacts waiting in Atlanta for those who attend. STLE's Annual Meeting Program and Education Committees, working together with our headquarters staff and paper solicitation chairs (PSCs) representing STLE's 20 technical committees, have developed an exciting program. It includes some 500 presentations devoted to all areas of tribology research and lubrication best practices, with presenters from academia, government and industry.

In addition to being recognized as one of the industry's premier technical meetings, the STLE Annual Meeting is also valued as an opportunity for enhancing your professional credentials through education and certification.

The STLE education program is growing in popularity with companies seeking a competitive advantage in today's faster-paced international business arena, where employee professional development has become an imperative. In a survey taken after the 2016 STLE Annual Meeting, participants rated education courses as the most valuable portion of the event in terms of meeting their business needs. 12 industry-specific courses will be presented in Atlanta taught by the top experts in their respected fields.

For more experienced professionals, the STLE Annual Meeting is often the place where individuals sit for one of STLE's four technical certification exams: Certified Lubrication Specialist™, Certified Metalworking Fluids Specialist™ and Oil Monitoring Analyst I & II™.

To learn about the industry's newest technologies, products and services, visit the exhibition, which is included in the meeting registration. More than 130 companies will have booths, demonstrations and information about how they can help you understand your lubrication systems, improve their performance and save energy.

Preliminary program details, housing and other pertinent information about the meeting are all included in this brochure for your convenience. If you require further information or assistance, please contact STLE headquarters or visit **www.stle.org** for program updates.

I hope to see you in Atlanta this May!

Sincerely,

Pranesh

Dr. Pranesh Aswath, Chair
2017 Annual Meeting
Program Committee

CONTENTS

General Information & Policies

The 2017 STLE Annual Meeting & Exhibition is sponsored by:

Society of Tribologists and Lubrication Engineers
840 Busse Highway, Park Ridge, Illinois (USA) 60068
Phone: (847) 825-5536 • Fax: (847) 825-1456
Email: info@stle.org • Web: www.stle.org

About STLE

The Society of Tribologists and Lubrication Engineers (STLE) is a not-for-profit professional society founded in 1944 to advance the science of tribology and the practice of lubrication engineering in order to foster innovation, improve the performance of equipment and products, conserve resources and protect the environment. Headquartered in Park Ridge, Ill. (a Chicago suburb), STLE is the leading technical organization serving more than 13,000 industry professionals and 250 companies and organizations that comprise the tribology and lubrication engineering business sector.

STLE offers its members industry-specific education and training, professional resources, technical information, certification programs and career development.

About Our Annual Meeting & Exhibition

STLE's conference is where some 1,600 members of the tribology research and lubrication engineering communities gather for five days of industry-specific technical education and professional development. Highlights include some 500 paper presentations, a 130-exhibitor trade show, the popular Commercial Marketing Forum and an opportunity to establish business contacts and friendships with your peers from around the world.

Annual Meeting & Education Course Policies

- All attendees must register.
- All attendees receive a badge with their registration materials. The badge must be worn at all times and is required for admittance to any technical session, education course and the trade show.
- Badges may not be exchanged. Attendees who loan their badges to others will have their badges confiscated and their annual meeting privileges rescinded.
- Annual Meeting registration includes admittance to the trade show, technical sessions, Commercial Marketing Forum and all social events, including the Monday evening Networking Reception and Tuesday afternoon Presidents Luncheon.
- Distributing handouts at technical sessions is not permitted. Handouts will be given to education course attendees.
- Disseminating material or conducting business in the exhibit hall is not permitted if you are not an official exhibitor.

Recording Policy

Audio or video recording is not permitted in any of the annual meeting technical sessions or Commercial Marketing Forum presentations. Audio recording is permitted in the education courses with advance permission of the instructor. No video of any kind is permitted.

Photo Policy

STLE's official photographer will take photos of select technical sessions, Commercial Marketing Forum presentations, social events and the trade show on Tuesday, May 23. These photos will be used to promote the May 20-24, 2018, STLE Annual Meeting & Exhibition in Minneapolis, Minnesota (USA). If you do not wish to have your photograph taken and published, please step out of the photo frame or notify the photographer afterward if your photo has been taken so the image can be deleted.

Cellular Phone Policy

In order to not disturb speakers or fellow attendees, please keep cellular telephones on vibrate and leave the room to talk.

Dress Code

Business casual dress is appropriate for STLE events at the annual meeting. Technical session and education course speakers often choose attire that is more formal on the day of their presentations.

Attendee Roster

The official attendee roster will be made available on the STLE website (www.stle.org) in early April 2017 prior to the annual meeting.

Annual Meeting Mobile App

Starting in April 2017, program updates will be posted daily on the STLE Annual Meeting Mobile App, which can be downloaded for free at www.tripbuilder.com/apps/stle. Or scan the adjacent QR code with your mobile device (available for Apple or Android products) to download the free app.

Registration Information

Meeting registration entitles you to all the technical sessions, trade show admission (Monday through Wednesday), Commercial Marketing Forum and all social events, including the Monday evening Networking Reception and Tuesday afternoon Presidents Luncheon. Education courses are $315 with full registration except for the ABMA Bearings Course ($615). Please see the registration form on page 29.

2017 STLE Annual Meeting **Registration Rates**

Individual			Single-Day
	Early Bird by April 27 (Save $100!)	After April 27	
STLE Member	$655	$755	**$275**
Speakers	$655	$755	
Presenters	$655	$755	
Non-members	$950	$1,050	**$340**
Life Member	$145	$145	
Student Member	$35	$35	

Onsite Registration

You may register on site at the Hyatt Regency Atlanta, beginning at 3 p.m. on Saturday, May 20, 2017. The STLE registration desk is open daily thereafter through Thursday, May 25. Onsite registrants incur a $100 surcharge. Advance registrants may pick-up badges and registration materials at the registration desk during the following hours:

- Sunday, May 21 – 7 am – 6 pm
- Monday, May 22 – 7 am – 6 pm
- Tuesday, May 23 – 7 am – 6 pm
- Wednesday, May 24 – 7 am – 6 pm
- Thursday, May 25 – 7 am – Noon

Cancellations

Requests must be received in writing at STLE's headquarters no later than April 27, 2017, to receive refund less $100 handling charge. No refunds will be issued after April 27.

Payment Method

STLE accepts U.S. currency, check drawn on a U.S. bank and major credit cards: Mastercard, Visa (preferred), American Express and Discover.

92% of surveyed attendees indicated that STLE's Annual Meeting met or exceeded their overall expectations.

HOW TO REGISTER:

Online

Visit **www.stle.org** to register at your convenience, 24/7.

Phone

Call STLE headquarters at (847) 825-5536 and register using a major credit card.

Mail

Use the enclosed registration form (see page 29) and send your completed form and payment by mail to STLE headquarters.

Fax

Complete the enclosed registration form and submit via fax to (847) 825-1456.

Non-Members Welcome: Two Options for Attending STLE 2017

STLE's core annual meeting audience is our membership of tribology researchers and lubrication professionals from around the globe. However, non-members are welcome at the conference and encouraged to attend. Participating in our conference is the best way to gain an overview of STLE's many products and services and meet your peers in the tribology and lubrication engineering communities.

STLE offers full and one-day annual meeting registration options. Because non-members pay a higher meeting registration rate, the best way to attend is by joining the society. Cost of membership is less than the difference between the member and non-member annual meeting registration rates. So you actually save money by joining STLE and coming to the meeting as a member than you would if you came as a non-member — plus you get all the other benefits of STLE membership!

However, if your company does not permit you to join a professional society, another option is to pay the non-member registration rate for the annual meeting. If you do, **you'll also receive a one-year free STLE membership — a $150 value.**

To learn more about the benefits of STLE and to access a membership application, log on to **www.stle.org** or call STLE headquarters at (847) 825-5536.

1,461

Average attendance at the STLE Annual Meeting (2013-2015), an increase of 254 attendees over the 2010-2012 average.

2017 Annual Meeting Program Committee

Dr. Pranesh Aswath – Chair
University of Texas at Arlington

Dr. Michel Fillon – Vice Chair
Universite De Poitiers

Dr. Ryan Evans – Secretary
The Timken Co.

Dr. Gareth Fish
The Lubrizol Corp.

Dr. Jeffrey M. Guevremont
American Refining Group Inc.

Dr. Robert Jackson
Auburn University

Dr. Min Zou
University of Arkansas

Get Social with Us!

Stay connected and keep up with the chatter using the hashtag **#STLE2017** when joining the conversation and stay up-to-date with meeting information and much more!

Twitter | **@STLE_Tribology**

Facebook | **Facebook.com/STLE**

Future Industry Meeting Dates

2017 World Tribology Congress
Beijing International Convention Center
September 17-22
Beijing, China

STLE 73rd Annual Meeting & Exhibition
Minneapolis Convention Center
May 20-24, 2018
Minneapolis, Minnesota

STLE 74th Annual Meeting & Exhibition
Omni Nashville Hotel
May 19-23, 2019
Nashville, Tennessee

STLE 75th Annual Meeting & Exhibition
Hyatt Regency Chicago
May 3-7, 2020
Chicago, Illinois

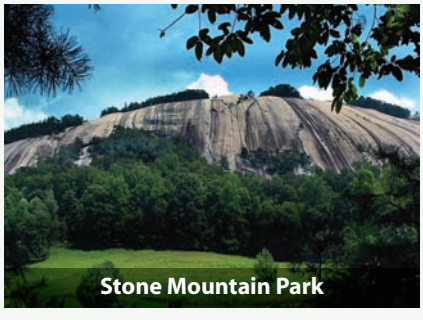
Atlanta is the capital and most populous city in the state of Georgia. As of 2009, Atlanta had an estimated population of about 540,922 people. Its metropolitan area is the ninth largest in the United States, inhabited by more than 5.4 million people. The Atlanta Combined Statistical Area has a population approaching six million, making it the most populous metropolis in the Southeastern U.S. Like many areas in the Sun Belt, the Atlanta region has seen increasing growth since the 1970s, and it added about 1.1 million residents between 2000 and 2008. Atlanta is the county seat of Fulton County and the location of the seat of government of the State of Georgia.

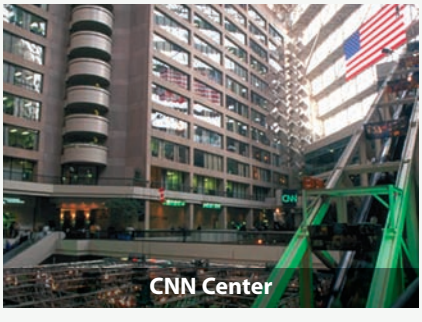
Atlanta is considered to be a top business city and is a primary transportation hub of the Southeastern U.S. (via highway, railroad, and air). Atlanta contains the world headquarters of such large corporations as The Coca-Cola Co., Georgia-Pacific, AT&T Mobility, the Cable News Network (CNN), Delta Air Lines, and Turner Broadcasting. Atlanta has the country's fourth-largest concentration of Fortune 500 companies and more than 75 percent of Fortune 1000 companies have business operations in the metropolitan area, helping Atlanta realize a gross metropolitan product of $270 billion, accounting for more than two-thirds of the Georgia economy. It's almost home to Hartsfield-Jackson Atlanta International Airport, which has been the world's busiest airport since 1998.

Notable Attractions*


Centennial Olympic Park


The Georgia Aquarium


Stone Mountain Park


CNN Center


The World of Coca-Cola


Zoo Atlanta

*For more information about Atlanta (including 50 fun things to do!), **visit www.atlanta.net**.

Need a Visa? **International attendees can request an invitation letter for the 2017 STLE Annual Meeting & Exhibition. For more information, contact Merle Hedland at (630) 428-2133, mhedland@stle.org.**

Housing & Room Reservations

Housing for the 2017 STLE Annual Meeting & Exhibition is at:

Hyatt Regency Atlanta
265 Peachtree Street NE, Atlanta, GA 30303
(404) 577-1234

Hyatt Regency Atlanta is located in the heart of downtown Atlanta on Peachtree Street. The hotel is a short drive from Hartsfield-Jackson Atlanta International Airport, connected to the MARTA transit system and blocks away from the city's major attractions.

With its signature Polaris blue dome, Hyatt Regency Atlanta has been a landmark destination since opening on Peachtree Street in 1967. In 2011, the hotel completed an historic $65 million transformation that renewed Hyatt Regency Atlanta's look and feel, as well as its restaurants and dining experiences, technology and functionality. The 22-story Atlanta luxury hotel was the world's first contemporary atrium hotel and today is one of America's premier meeting and convention destinations.

Attendees are encouraged to stay at the Hyatt Regency Atlanta, as doing so helps STLE reduce the costs of future annual meetings. STLE has negotiated a rate of $175 a night (taxes are not included) at the Hyatt Regency Atlanta through April 27, 2017. U.S. Government rate rooms are limited; proof of federal government employment must be shown at check-in or higher rate will be charged. U.S. Government rate is the prevailing government rate.

However, STLE cannot guarantee housing at the Hyatt Regency Atlanta will be available through April 27. Reservations are made on a first-come, first-served basis. If you plan on attending the 2017 STLE Annual Meeting, you are urged to make your room reservations as soon as possible.

Hyatt Regency hotel

Reserve Your Room By April 27, 2017

- Call to make hotel reservations at (888) 421-1442
- Be sure to provide the group code: **STLE**
- Make all hotel reservation changes or cancellations directly with the Hyatt Regency
- Visit **www.stle.org** for a shortcut to the hotel registration site.

*As of Dec. 7, 2016. Schedule is subject to change. Please visit **www.stle.org** for the most current information. Registrants also will receive a Program Guide at the meeting with updated information.

Daily Schedule-at-a-Glance

Saturday, May 20, 2017

3 – 6 pm ..... Onsite Registration

Sunday, May 21, 2017

7 am – 6 pm ..... Onsite Registration
7 – 8 am ..... Speakers Breakfast
8 am – 5 pm ..... Education Courses (***registration required**)
1:30 – 5 pm ... Nanotribology Special Session (***registration required**)
12:30 – 7 pm ..... Golf Tournament (***registration required**)
6:30 – 8 pm ..... Early Careerist Networking Event (Location TBD)

Monday, May 22, 2017

7 am – 6 pm ..... Onsite Registration
7 – 8 am ..... Speakers Breakfast
8 – 10 am ..... Technical Sessions/CMF
8 am – 2 pm ..... Tribology STEM Camp
10 – 10:30 am ..... Refreshment Break
10:30 am – Noon ..... Opening General Session (Keynote Address TBD)
Noon – 1:30 pm ..... Lunch (on your own)
Noon – 5 pm ..... **Commercial Exhibits and Student Posters**
1:30 – 6 pm ..... Technical Sessions/CMF
3 – 4 pm ..... **Exhibitor Appreciation Break**
6:30 – 8 pm ..... Networking Reception

Tuesday, May 23, 2017

7 am – 6 pm ..... Onsite Registration
7 – 8 am ..... Speakers Breakfast
8 – 10 am ..... Technical Sessions/CMF
9:30 am – Noon ..... **Commercial Exhibits and Student Posters**
10 – 10:30 am ..... Refreshment Break
Noon – 2 pm ..... Presidents Luncheon/Business Meeting
2 – 6 pm ..... Technical Sessions/CMF
2 – 5:30 pm ..... **Commercial Exhibits and Student Posters**
3 – 4 pm ..... **Exhibitor Appreciation Break**

Wednesday, May 24, 2017

7 am – 6 pm ..... Onsite Registration
7 – 8 am ..... Speakers Breakfast
8 am – 5 pm ..... Education Courses (***registration required**)
8 am – Noon ..... Technical Sessions/CMF
9:30 am – Noon ..... **Commercial Exhibits and Student Posters**
10 – 10:30 am ..... Refreshment Break
Noon – 1:30 pm ..... Lunch (on your own)
1:30 – 6 pm ..... Technical Sessions/CMF
3 – 3:30 pm ..... Refreshment Break

Thursday, May 25, 2017

7 am – Noon ..... Onsite Registration
7 – 8 am ..... Speakers Breakfast
8 am – Noon ..... Technical Sessions
8:30 am – 12:30 pm ... STLE Certification Exams (***registration required**)
10 – 10:30 am ..... Refreshment Break
Noon – 1:30 pm ..... Lunch (on your own)
1:30 – 6 pm ..... Technical Sessions
3 – 3:30 pm ..... Refreshment Break

stle Technical Sessions
ATLANTA

The following is a preliminary schedule that will be updated right up until the meeting. Please visit **www.stle.org** for the most current information. Registrants also will receive a Program Guide at the meeting with updated information.

***As of Dec. 7, 2016 – Subject to Change**.

Monday, May 22, 2017

1B | Commercial Marketing Forum I

8 – 8:30 am | Functional Products, Inc.

8:30 – 9 am | Chevron Phillips Chemical Company

9 – 9:30 am | Sea-Land Chemical Company

9:30 – 10 am | Croda, Inc.

10 – 10:30 am – Break

1C | Metalworking I

8 – 8:30 am | Multiple Light Scattering for the Analysis of Physical Stability of Concentrated Dispersions

Matt Vanden Eynden, Formulaction, Inc, Worthington, OH, Christelle Tisserand, Mathias Fleury, Yoann Lefeuvre, Pascal Bru, Gerard Meunier, Formulaction, L'Union, France

8:30 – 9 am | The Role of the Pin & Vee Block Torque Curve for Aluminium Alloys

Kathy Helmetag, Henkel, Warren, MI, Dirk Drees, Emmanuel Georgiou, Michel De Bilde, Falex Tribology NV, Rotselaar, Belgium

9 – 9:30 am | Clean & Green: Improving Process Life for Induction Quenching Auto Parts Production

Eduardo Lima, FASB – Philosophy and Sciences College, São Paulo, São Paulo, Brazil

9:30 – 10 am | Statistical Interpretation of Twist Compression Test (tct) Results on Metal Deformation Fluids

Joseph Schultz, Elizabeth Schiferl, Johnnie Thomlison, Brett Wessler, The Lubrizol Corporation, Wickliffe, OH

10 – 10:30 am – Break

1D | Materials Tribology I

8 – 8:30 am | Selecting Powder Steel for Manufacturing Valve Seats on Diesel Engines

Nelly Alba de Sanchez, Andres Saavedra, Gustavo Agudelo Ospina, Andres Torres, Juan de Jesus Galindo, Faber Correa Ballesteros, Pedro Arango, Andres Rodriguez, Universidad Autónoma de Occidente, Cali, Colombia

8:30 – 9 am | Friction Behaviors of Interfaces Between Friction Components and Copper Matrix in Copper-based Composites

Taimin Gong, Pingping Yao, Central South University, Changsha, Hunan, China

9 – 9:30 am | The Origin of Micro-structural Discontinuities Underneath a Tribologically Loaded Surface

Christian Greiner, Zhilong Liu, Reinhard Schneider, Lars Pastewka, Peter Gumbsch, Karlsruhe Institute of Technology, Karlsruhe, Germany

9:30 – 10 am | Nanocrystalline PtAu MEMS Electrical Switches

Michael Dugger, Nicolas Argibay, David Adams, Christopher Nordquist, Alejandro Grine, Michael Henry, Sandia National Laboratories, Albuquerque, NM

10 – 10:30 am – Break

1E | Environmentally Friendly Fluids I

8 – 8:30 am | Addressing the Thermo-Oxidative Stability of Environmentally Friendly Biobased Lubricants

Ashok Cholli, Polnox Corporation, Lowell, MA

8:30 – 9 am | The Growing Benefits of the Estolide

Jacob Bredsguard, Biosynthetic Technologies, Irvine, CA

9 – 9:30 am | Polyalkylene Glycols as Enablers of Polyol Esters in Environmentally Acceptable Lubricants

Lauren Huffman, Gagan Srivastava, Andrew Larson, Martin Greaves, The Dow Chemical Company, Midland, MI

9:30 – 10 am | Environmentally Friendly Lubricants Can Now Provide Superior Reliability

Keith Snyder, Calumet Specialty Products Partners, L.P., Indianapolis, IN

10 – 10:30 am – Break

1F | Fluid Film Bearings I

8:30 – 9 am | Two Magnetorheological Elastomer Devices for the Control of Aerostatic Thrust Bearing: Thru Regulating Air Flow or Surface Curvature

Sy-Wei Lo, Tsung-Ti Shu, Jyun-Lin Li, National Yunlin University of Science & Technology, Douliu City, Yunlin County, Taiwan, Tsuo-Fei Mao, Chienkuo Technology University, Changhua, Taiwan

9 – 9:30 am | Rotor Trajectory Control in the Lubricant Film of Journal and Thrust Fluid-Film Bearings

Alexander Babin, Denis Shutin, Leonid Savin, Oryol State University n.a. I.S. Turgenev, Oryol, Russian Federation

9:30 – 10 am | Effective Methods for Monitoring PEEK Bearing Temperature: Metal Versus Oil

Jie Zhou, Barry Blair, Donald Pitsch, Waukesha Bearings Corp., Pewaukee, WI

10 – 10:30 am – Break

1G | NanoAdditives Joint Session I

8 – 8:30 am | Tribological Properties of an Industrial Lubricant Containing Inorganic Fullerene-Like Tungsten Disulfide (IF-WS_2) Nanoparticles

Roger Soto-Castillo, Nanotech Industrial Solutions, Avenel, NJ

8:30 – 9 am | Interactions of IF-MeS_2 (Me=Metal) Nanoparticle Additives with Lubricant Co-Additives

Fabrice Dassenoy, Ecole Centrale de Lyon, Ecully, France, Paula Ussa, TOTAL, Lyon, France, Pierre Rabaso, PSA, Velizy, France, Fabrice Ville, INSA Lyon, Lyon, France, Benoit Thiebaut, TOTAL , Lyon, France, Moussa Diaby, PSA, Velizy, France

9 – 9:30 am | The Performance of Translucent Silicon-Oxide Nanoparticle Lubricant Additives

Zoe Tucker, Robert Jackson, Mohammed Hossain, German Mills, Auburn University, Auburn, AL

9:30 – 10 am | Surface-Modified Silver Nanoparticles as Lubricant Additives

Chanaka Kumara, Huimin Luo, Jun Qu, Oak Ridge National laboratory, Oak Ridge, TN

10 – 10:30 am – Break

1H | Tribotesting I

8 – 8:30 am | Material Hardness Evaluations at Elevated Temperatures

Michael Moneer, Peter Lee, Southwest Research Institute, San Antonio, TX, Steven Shaffer, Bruker Nano Surfaces Division, San Jose, CA

8:30 – 9 am | The Use of Novel Specimen Designs in Reciprocating Line Contact Tests

George Plint, Phoenix Tribology Ltd, Kingsclere, United Kingdom

9 – 9:30 am | Advanced Characterization Method to Investigate Friction, Wear & Surface Morphology Change with Time

Tushar Khosla, Rtec-Instruments, San Jose, CA

9:30 – 10 am | Effect of Running-in Conditions on Repeatability of Friction and Wear Testing Results

Howard Benade, Philip de Vaal, University of Pretoria, Pretoria, Gauteng, South Africa

10 – 10:30 am – Break

1I | Wind Turbine Tribology I

8 – 8:30 am | Generation of Electric Current in Tribocontact & Electrically Caused Microstructure Alterations

Mihails Scepanskis, University of Latvia, Riga, Latvia, Benjamin Gould, University of Delaware, Wilmington, DE, Aaron Greco, Argonne National Laboratory, Lemont, IL, Viktorija Smelova, University of Southampton, Southampton, United Kingdom, Ling Wang, Southampton University, Southampton, United Kingdom, Imants Kaldre, Andris Jakovics, University of Latvia, Riga, Latvia

8:30 – 9 am | Formation of White Etching Cracks (WECs) in Rolling Bearing Steel & Their Relationship to Premature Bearing Failures

Francesco Manieri, Pawel Rycerz, Tribology Group, Imperial College London, London, United Kingdom, Kenred Stadler, SKF, Schweinfurt, Germany, Amir Kadiric, Tribology Group, Imperial College London, London, United Kingdom

9 – 9:30 am | A Study on the Evolution of Microstructure Alterations in White Etching Cracks

Viktorija Smelova, University of Southampton, Southampton, United Kingdom, Alexander Schwedt, RWTH Aachen University, Aachen, Germany, Ling Wang, University of Southampton, Southampton, United Kingdom, Walter Holweger, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany, Joachim Mayer, RWTH Aachen University, Aachen, Germany

9:30 – 10 am | Influence of Calcium Sulfonate on the Diffusion of Hydrogen and Formation of White Etching Cracks (WECs) in Rolling Contact Fatigue Tested 100Cr6 Bearing Steels

Alex Richardson, Ling Wang, Martin Evans, Robert Wood, Zachary Rowland, University of Southampton, Southampton, United Kingdom, Marc Ingram, Afton Chemical, Bracknell, United Kingdom

10 – 10:30 am – Break

2A | Nanotribology I

1:30 – 2:30 pm | Invited Talk

Elisa Riedo, CUNY-City College of New York, New York, NY

2:30 – 3 pm | Rheology in Nanometer-confined Liquid and Boundary Shearing

Hongyu Gao, Martin Müser, Saarland University, Saarbrucken, Germany

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Simulation, Rheology, and Efficiency of Polymer-Enhanced Hydraulic Fluids

Uma Shantini Ramasamy, Ashlie Martini, University of California-Merced, Merced, CA, Paul Michael, Milwaukee School of Engineering, Milwaukee, WI

4:30 – 5 pm | Friction Behavior of Cyclohexane Film Under Nanoconfinement

Yongsheng Leng, The George Washington University, Washington, DC

5 – 5:30 pm | Open

2B | Commercial Marketing Forum II

1:30 – 2 pm | Münzing

2 – 2:30 pm | Sasol North America, Inc.

2:30 – 3 pm | ExxonMobil Chemical Company

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Novitas Chemical Solutions, LLC

4:30 – 5 pm | Chemtura Corporation

5 – 5:30 pm | Emery Oleochemicals

5:30 – 6 pm | Evonik Oil Additives, Inc.

2C | Metalworking II

1:30 – 2 pm | Effects of Filtration on Defoamer Performance in Aqueous Metal Removal Fluids

Ernest Galgoci, Joseph Panzariello, James Sullivan, Justin Mykietyn, Münzing, Bloomfield, NJ

2 – 2:30 pm | Boundary Lubricant Additive Response Comparisons on Various Metals Using Twist Compression Tests (TCT)

Ted McClure, Sea-Land Chemical – SLC Testing Services, Westlake, OH

2:30 – 3 pm | Critical Examination of Foam Test Methods for Aqueous Metal Removal Fluids

Justin Mykietyn, James Sullivan, Ernest Galgoci, Joseph Panzariello, Münzing, Bloomfield, NJ

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Influence of Neutralizers/pH Adjusters in Water-Dilutable Metalworking Fluids on Lubrication of 6061 Aluminum

Patrick Brutto, Bonnie Pyzowski, Soraya Kraszczyk, ANGUS Chemical Co., Buffalo Grove, IL

4:30 – 5 pm | Biofouling Control in Metalworking Fluids

Brian Corbin, Dow Microbial Control, Collegeville, PA

5 – 5:30 pm | Microbial Misconceptions II

Nicole Webb, ANGUS Chemical Company, Buffalo Grove, IL

5:30 – 6 pm | Chemo-Mechanical Magnetorheological Polishing of Bearing Steel Substrate

Wenpeng Jia, Yu Tian, State Key Laboratory of Tribology, Beijing, Beijing, China

2D | Materials Tribology II

1:30 – 2 pm | Faked Adhesion Caused by Material Viscoelasticity in None Fully Detaching Test

Zheyu Liu, Hongyu Lu, Dashuai Tao, Xiangjun Zhang, Yonggang Meng, Yu Tian, The State Key Laboratory of Tribology, Tsinghua University, Beijing, China

2 – 2:30 pm | First Contact: Adhesion Hysteresis in Soft Interfaces

Kyle Schulze, Alexander Bennett, Yongliang Ni, Greg Sawyer, University of Florida, Gainesville, FL

2:30 – 3 pm | Elastic-Plastic Sinusoidal Contact Under Combined Normal and Tangential Loading

Xianzhang Wang, Yang Xu, Robert Jackson, Auburn University, Auburn, AL

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Illuminating Pressing Problems with Rough Contacts

Alex Bennett, University of Florida, Gainesville, FL, Kathryn Harris, Kungliga Tekniska Högskolan, Stockholm, Sweden, Kyle Schulze, Juan Manuel Uruena, Angela Pitenis, Sean Niemi, Samantha Marshall, Samuel Hart, Thomas Angelini, Greg Sawyer, University of Florida, Gainesville, FL

4:30 – 5 pm | In-Situ and In-Silico Study of Adhesion, Deformation, and Area of Contact Between Nanoscale Asperities

Sai Bharadwaj vishnubhotla, University of Pittsburgh, Pittsburgh, PA, Subarna Khanal, University of Pittsburgh, Pittsburgh, PA, Rimei Chen ,Shelly Hu, Ashlie Martini, Unversity of California-Merced, Merced, CA, Tevis Jacobs, University of Pittsburgh , Pittsburgh, PA

5 – 6 pm | The Contact Mechanics Challenge

2E | Environmentally Friendly Fluids II

1:30 – 2 pm | Evaluation of Environ - mentally Acceptable Lubricants for Arctic Thruster Systems

Ichiro Minami, Bharath Sundararajan, Lulea University of Technology, Lulea, Sweden, Arto Lehtovaara , Matti Savolainen, Tampere University of Technology, Tampere, Finland

2 – 2:30 pm | Evaluation of IF-WS_2 in Ester Lubricants

Bryan Bergeron, Hicham Saade, A.W. Chesterton, Groveland, MA

2:30 – 3 pm | Selecting the Right GpV Base Stock to Achieve Friction Reduction

Matthias Hof, Emery Oleochemicals GmbH, Monheim, NRW, Germany

3 pm – Exhibitor Appreciation Break

4 – 5 pm | Panel Discussion

5 – 5:30 pm | EFF Business Meeting

2F | Fluid Film Bearings II

1:30 – 2 pm | Impact of Measurement Uncertainties on the Validation of Mixed Lubrication Simulation

Sebastian Fricke, Sergey Solovyev, Ulrich Stolz, Johannes Bette, Jürgen Vdovak, Robert Bosch GmbH, Renningen, Germany, Matthias Wangenheim, Jörg Wallaschek, Institute of Dynamics and Vibration Research, University of Hanover, Hanover, Germany

2 – 2:30 pm | Comparison of Cavitation Models within the Solution Framework of Both the Reynolds and Navier-Stokes Equations on the Static Performance and Dynamic Properties of Journal Bearings

Troy Snyder, Minel Braun, The University of Akron, Akron, OH

2:30 – 3 pm | Comparison of Reynolds Equation and CFD Simulations for Evaluation of a Grooved Journal Bearing with Injection

Kristopher Pierson, Minel Braun, Troy Snyder, The University of Akron, Akron, OH

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Design of Cooled Tilting-Pad Bearings Obtained with Additive Manufacturing Technology

Steven Chatterton, Paolo Pennacchi, Phuoc Dang, Andrea Vania, Politecnico di Milano, Milan, Italy

4:30 – 5 pm | Efficient Numerical Analysis of Textured Hydrodynamic Bearings

Daniel Gropper, Ling Wang, Terry Harvey, University of Southampton, Southampton, Hampshire, United Kingdom, Klaus-Dieter Meck, Vladimir Gviniashvili, John Crane UK Ltd, Manchester, United Kingdom

5 – 5:30 pm | Computational Aspects of Iterative Solution Method for Reynolds Equation

Nenzi Wang, Hsin-Yi Chen, Chang Gung University, Tao-Yuan, Taiwan

2G | NanoAdditives Joint Session II

1:30 – 2 pm | Quartz Crystal Microbalance and Atomic Force Microscope Study of Atomic Scale Polishing and Roughening of Surfaces Exposed to Nanoparticle Suspensions of Diamond, Al_2O_3 and SiO_2

Biplav Acharya, Melanie Chestnut, Antonin Marek, NCSU, Raleigh, NC, Olga Shendarova, Adámas Nanotechnologies, Inc., Raleigh, NC, Alex Smirnov, Jacqueline Krim, NCSU, Raleigh, NC

2 – 2:30 pm | Water Soluble Carbon Nanodot as Lubricant Additive for Ceramic-on-Ceramic and Ceramic-on-Steel Contacts

Huaping Xiao, Shuhai Liu, Quan Xu, China University of Petroleum-Beijing, Beijing, China

2:30 – 3 pm | The Tribological Properties of Silica Nanoparticles as Additives for Aqueous Lubrication

Tianyi Sui, Bin Lin, Tianjin University, Tianjin, China

3 pm – Exhibitor Appreciation Break

2H | Tribotesting II

1:30 – 2 pm | On the Load Dependence of the Friction Coefficient

Kenneth Budinski, Bud Labs, Rochester, NY

2 – 2:30 pm | Fretting Wear of Nuclear Fuel Claddings in High-Temperature High-Pressurized Water

Jun Qu, Sladjan Lazarevic, Oak Ridge National Laboratory, Oak Ridge, TN, George Plint, Phoenix Tribology Ltd, Kingsclere, United Kingdom, Roger Lu, Westinghouse

2:30 – 3 pm | Testing Study of Fretting for Involute Spline

Yuanqiang Tan, Huaqiao University, Xiamen, China

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Experimental Study of the Influence of Contact Conditions and Lubricant Properties on the Onset of Scuffing Using a New Contra-Rotation Test Method

Bo Peng, Guoquan Huang, Amir Kadiric, Imperial College London, London, United Kingdom

4:30 – 5 pm | A Screening Test Method for Evaluation of Energy Efficiency of Industrial Gear Oils

R Mahapatra, M K Dubey, R Meshram, Ajay Harinarain, IOCL R&D Centre Sector 13 Faridabad, Faridabad, Haryana, India, A. Bhardwaj, S K Mazumdar, IOCL R&D Centre, Faridabad, Harayana, India

5 – 5:30 pm | Prediction of Friction Coefficients and Mechanical Power Loss of Spur Gears

Jie Cheng, Yuxu Geng, Zhangjiang Wang, Chongqing University , Shapingba District, Chongqing, China, Qian Wang, Northwestern University, Evanston, IL

5:30 – 6 pm | Crossing the Boundary of Static Friction – An Experimental Study

Charlotte Reppich, Kartik Pondicherry, Anton Paar GmbH, Graz, Austria

2I | Wind Turbine Tribology II

1:30 – 2 pm | Using Tomography Techniques to Investigate the Development of White Etching Cracks in Bearing Steel

Benjamin Gould, University of Delaware, Wilmington, DE, Aaron Greco, Argonne National Laboratory, Lemont, IL, Kenred Stadler, SKF GmbH, Schweinfurt, Germany, Erik Vegter, SkF B.V., Nieuwegein, Netherlands

2 – 2:30 pm | Investigating the Dominant Drivers of White Etching Crack Formation in Accelerated Benchtop Testing

Benjamin Gould, Aaron Greco, Argonne National Laboratory, Lemont, IL

2:30 – 3 pm | Wear Analysis of Main Bearings

Arnab Ghosh, Sentient Science, Indianapolis, IN

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | New Grease Technology and Synthetic Base Oils for Wind Turbines

James Dimas, Koetsu Wada, Idemitsu, Southfield, MI

4:30 – 5 pm | Measurements of Individual Contacts in Wind Turbine Rolling Bearings: Experience from the Field

Rob Dwyer-Joyce, Gary Nicholas, University of Sheffield, Sheffield, United Kingdom

5 – 6 pm | Panel Discussion

6 – 6:30 pm | Wind Tribology Business Meeting

Tuesday, May 23, 2017

3A | Nanotribology II

8 – 8:30 am | Atomic Scale Simulation of Friction Reduction and Wear Protection of Monolayer MoS_2

Yang Liu, Yuhong Liu, Jianbin Luo, Tsinghua University, Beijing, China

8:30 – 9 am | An Examination of DLC Adhesion using MD and In-Situ Nanoindentation

Judith Harrison, US Naval Academy, Annapolis, MD, J Schall, Oakland University, Rochester, MI, Rodrigo Bernal, University of Pennsylvania, Philadelphia, PA, Polun Chen, Ping-Chi Tsai, Yeau-Ren Jeng, National Chung Cheng University, Chiayi County, Minxiong Township, Taiwan, Robert Carpick, University of Pennsylvania, Philadelphia, PA

9 – 10 am | Invited Talk

George Pharr, University of Tennessee, Knoxville, TN

10 – 10:30 am – Break

10:30 – 11 am | Surface Topography Across Length Scales: The Experimental Characterization of Ultrananocrystalline Diamond from Angstroms to Centimeters

Abhijeet Gujrati, Subarna Khanal, Tevis Jacobs, University of Pittsburgh, Pittsburgh, PA

11 – 11:30 am | Testing the Limits of Continuum Contact Mechanics at Small Scales and High Loads

Tevis Jacobs, Sai Bharadwaj Vishnubhotla, Subarna Khanal, University of Pittsburgh, Pittsburgh, PA, Rimei Chen, Shelly Hu, Ashlie Martini, University of California-Merced, Merced, CA

11:30 am – Noon | Nanoscale In-Situ Friction Test With Nanoparticles in the TEM: See What You Are Doing

Fabrice Dassenoy, Istvan Jenei, Ecole Centrale de Lyon, Ecully, France

3B | Commercial Marketing Forum III

8 – 8:30 am | Evonik Oil Additives, Inc.

8:30 – 9 am | Chevron Phillips Chemical Company

9 – 9:30 am | Ingevity

9:30 – 10 am | Savant Labs

10 – 10:30 am – Break

10:30 – 11:00 am | ANGUS Chemical Company

11:00 – 11:30 am | King Industries, Inc.

11:30 – Noon | Novitas Chemical Solutions LLC

3C | Metalworking III

8 – 8:30 am | Friction Control and Coolant Separability of Slideway Lubricants

Marc Ingram, Paul Norris, Carl Williams, Gabriel Clarke, Afton Chemical Ltd, Bracknell, United Kingdom

8:30 – 9 am | Cutting Tools: Investigation of Materials, Coatings and Coolant for Effective Cutting Tool Life

Peter Lee, Southwest Research Institute, San Antonio, TX, Thomas Stinnett, Lockheed Martin, Austin, TX, Michael Moneer, Southwest Research Institute, San Antonio, TX

9 – 9:30 am | Study of the Hot Corrosion Process & the Influence of Metalworking Fluid Properties on Hot Corrosion of Aluminium 2024-T3

Chelsea Good, Robert Evans, Quaker Chemical Corp, Conshohocken, PA

9:30 – 10 am | Toxic Metal Emissions from Dry Machining Operations

John Burke, Houghton International, Inc., Valley Forge, PA, Michael Pearce, W. S. Dodge Oil, Inc., Maywood, CA, Alan Cross, Houghton International, Inc., Valley Forge, PA

10 – 10:30 am – Break

10:30 – 11 am | Pine Chemistry Derived Esters as Additives for Metalworking Fluids

Eric Olivier, Monica Ford, Ingevity, North Charleston, SC

11 – 11:30 am | Replacement of Secondary Amines in Metalworking Formulas With Primary and Tertiary Amines

Guy Verdino, Eastman Chemical, Elk Grove Village, IL

11:30 am – Noon | Optimizing Mineral Oil-Free Metalworking Fluid Tapping Performance with Design of Experiment

Jason Pandolfo, Quaker Chemical Corp., Conshohocken, PA

3D | Materials Tribology III

8 – 8:30 am | Tribology Performance and Adhesive Strength Evaluation of Ti_1-xAlx-N Coatings

Lan Yan, Tao Zhang, Feng Jiang, Huaqiao University, Xiamen, China

8:30 – 9 am | Scratch Resistance & Indentation Hardness of Nano - porous Structures

Diana Berman, University of North Texas, Denton, TX, Elena Shevchenko, Argonne National Laboratory, Argonne, IL

9 – 9:30 am | Wear Mechanisms in Annealed Atomic Layer Deposited Alumina Thin Films

Zakaria Hsain, Guosong Zeng, Nicholas Strandwitz, Brandon Krick, Lehigh University, Bethlehem, PA

9:30 – 10 am | Performance of Wear Resistant Resin Bonded Solid Film Lubricants on 6000-Series Aluminum with Deposited Ceramic Surface Modification through Plasma Electrolytic Oxidation Process

Aureliano Perez, Texas High Energy Materials, LLC, Austin, TX

10 – 10:30 am – Break

10:30 – 11 am | Tribochemistry of ta-C Coatings in Base Oil – The Key-role of Counterface Material

Stéphanie Lafon-Placette, Julien Fontaine, Maria-Isabel De Barros Bouchet, Laboratoire de Tribologie et Dynamique des Systèmes, Ecole Centrale de Lyon, Ecully, France, Christophe Heau, Ireis Hef, Andrézieux-Bouthéon, France

11 – 11:30 am | Effects of Load and Humidity on Friction Fade-out in DLC Films Sliding Against ZrO_2 Pins in an H_2 and N_2 Gas Environment

Takahisa Kato, Masataka Nosaka, The University of Tokyo, Tokyo, Japan, Atsushi Murase, Mamoru Tohyama, Toyota Central R&D Labs., Inc., Nagoya, Japan, Masahiro Suzuki, Jtekt Corporation, Nara, Japan

11:30 am – Noon | On the Solid Lubrication Processes of Silicon Oxide Containing Hydrogenated Amorphous Carbon Coatings

Julien Fontaine, Ecole Centrale de Lyon, Ecully Cedex, France, Medard Koshigan, Ecole Polytechnique Montreal, Montreal, Quebec, Canada, Filippo Mangolini, University of Leeds, Leeds, United Kingdom, Brandon McClimon, Robert Carpick, University of Pennsylvania, Philadelphia, PA

3E | Surface Engineering I

8 – 8:30 am | Experimental Investigation of Surface Film Finish Time and Curing Finish Time of Replicating Materials Microset 101 RT

Harold McCormick, C-K Engineering, Inc., Ellisville, MO, Jianfeng Ma, Changqing Qiu, Saint Louis University, Saint Louis, MO,

8:30 – 9 am | Inhibitory Effect of the Sliding Surface Damage Due to the Discharge

Kenji Matsumoto, Honda R & D, Haga, Tochigi, Japan, Naoaki Yoshida, Kyushu University, Kasuga, Japan, Akira Sasaki, Maintek Consultant , Yokohama, Japan

9 – 9:30 am | Elasto-Plastic Contact of Non-Conformal Rough Surfaces

Itzhak Green, Georgia Institute of Technology, Atlanta, GA, Leander Reinert, Sebastian Suarez, Saarland University, Saarbruecken, Germany

9:30 – 10 am | Effect of Laser Treatment on Plasma Sprayed WC-12%Co Cermet Coating using Fe and Ni Base Substrates

Mohammad Ajmal, Mohammad Mughal, Mohammad Afzal, UET, Lahore, Pakistan

10 – 10:30 am – Break

10:30 – 11 am | Experimental Study of the Permanent Deformation Patterns After the Low Speed Collision of a Rigid Rod with an Elastic-Plastic Lubricated Flat

Hamid Ghaednia, Dan Marghitu, Robert Jackson, Auburn University, Auburn, AL

11 – 11:30 am | Spreading Dynamics of Liquid Droplets Under Different Ambient Pressure

Lichun Shi, Tsinghua University, Beijing, China, Roger Horn, Deakin University, Melbourne, Victoria, Australia, Yu Tian, Tsinghua University, Beijing, China

11:30 am – Noon | The Use of Graphene & DLC to Reduce Friction and Wear in Automotive Engines

Lawrence Li, Kalyan Mutyala, Stephen Hsu, The George Washington University, Washington, DC

3F | Fluid Film Bearings III

8 – 8:30 am | Coupled Porovisco-elasticity and Hydrodynamic Lubrication in Thrust Bearings

Patrick Smyth, Itzhak Green, Georgia Institute of Technology, Atlanta, GA

8:30 – 9 am | On Optimum Geometry for a Thrust Bearing Operating on a Polyurethane Foam Slider Imbibed With Liquid

Sergey Kunik, Aurelian Fatu, Jean Bouyer, Pprime Institute, Futuroscope Chasseneuil Cedex, France

9 – 9:30 am | Analysis of Couple-Stresses and Piezo-Viscous Effects in a Layered Connecting-Rod Bearing Using a Global Thermal Approach

Benyebka Bou-Said, INSA, Villeurbanne, France

9:30 – 10 am | Quantitative Elastohydrodynamic Film-Forming for an Oil/Refrigerant System

Scott Bair, Georgia Institute of Technology, Atlanta, GA, Wassim Habchi, Lebanese American University, Byblos, Lebanon, Mark Baker, CPI Fluid Engineering, Midland, MI

10 – 10:30 am – Break

10:30 – 11 am | Combined Effects of Couple Stress and Poro-Elasticity on Squeeze Film Between Parallel Plates

Benyebka Bou-Said, INSA, Villeurbanne, France

11 – 11:30 am | Dynamic Modeling of a Dual Clearance Squeeze Film Damper Operating with Air Entrainment

Laurentiu Moraru, University Politehnica of Bucharest, Bucharest, Bucharest, Romania, Theo Keith Jr., Sorin Cioc, The University of Toledo, Toledo, OH, Florin Dimofte, The University of Toledo at NASA GRC, Toledo, OH, David Fleming, NASA Glenn Research Center (retired), Cleveland, OH

11:30 am – Noon | A Numerical Model for Mechanical Interaction of Rough Surfaces of Hydrodynamic Tribo - systems of Piston Engines Taking Into Account Rheological Characteristics of Lubricants

Konstantin Gavrilov, South Ural State University, Chelyabinsk, Russian Federation, Yurii Goritskiy, National Research University "Moscow Power Engineering Institute", Moscow, Russian Federation, Yury Rozhdestvensky, South Ural State University, Chelyabinsk, Russian Federation, Ivan Migal, Yulia Ismailova, National Research University "Moscow Power Engineering Institute", Moscow, Russian Federation

3G | Lubrication Fundamentals I

Additives & Additives Degradation

8 – 8:30 am | Lubricant Shear Stability Mechanism Study

Philip Ma, Shouxun Zhao, Andreas Minke, BASF, Tarrytown, NY

8:30 – 9 am | A New Approach to Probe the Interactions Between Viscosity Modifiers and Waxes Present in Engine Oil

Solmaz Pirouz, University of Waterloo, Waterloo, Ontario, Canada

9 – 9:30 am | ZDDP Tribochemistry Influenced by Oxidative Degradation

Nicole Doerr, Christoph Gabler, Andjelka Ristic, Marcella Frauscher, AC2T Research GmbH, Wiener Neustadt, Austria

9:30 – 10 am | Aged Oil Frictional Properties of Organometallic and Organic Rriction Modifiers

Mihir Patel, Brian Casey, Vincent Gatto, Vanderbilt Chemicals, LLC, Norwalk, CT

10 – 10:30 am – Break

10:30 – 11 am | Base Oil and Antioxidant Selection – The Role of Secondary Antioxidants and Base Oil Sulfur Content

Thomas Norrby, Nynas AB, Nynashamn, Sweden, Ann-Louise Jonsson, Naphthenics Reseach, Nynas AB, Nynashamn, Sweden

11 – 11:30 am | Microencapsulation of Friction Modifiers for Engine Oils

Shanhong Xu, Fei Zhao, Stephen Hsu, The George Washington University, Washington, DC

11:30 am – Noon | Effect of Urban Automobile Running Parameters on Lubricating Oil Properties

Lei Wei, Haitao Duan, Song Chen, Bingxue Cheng, Jian Li, Wuhan Research Institute of Materials Protection, Wuhan, Hubei, China

3H | Synthetics & Hydraulics I

8 – 8:30 am | The Role of Interfacial Forces in Non-aqueous Foam Stability and Rupture

Abhishek Kar, Shell Global Solutions US Inc., Houston, TX

8:30 – 9 am | Foaming and Antifoaming of Lubricating Fluids – Part I: Fundamentals of Foaming in Lubricating Oils and the Chemistry of Antifoams Used in Them

Kalman Koczo, Mark Leatherman, Momentive Performance Materials, Tarrytown, NY, Kevin Hughes, Don Knobloch, The Lubrizol Corporation, Wickliffe, OH

9 – 9:30 am | Foaming and Antifoaming of Lubricating Oils – Part II: Mechanisms of Antifoaming Action and Air Entrainment

Kalman Koczo, Mark Leatherman, Momentive Performance Materials, Tarrytown, NY, Kevin Hughes, Don Knobloch, The Lubrizol Corporation, Wickliffe, OH

9:30 – 10 am | Experimental Study on the Effect of Hygroscopic Properties on Lubrication Performance of Refrigeration Oil

Ruihong Kong, Jin Zhu, Yihong Sun, Shuo Zhang, Shanghai Hitachi Electrical Appliances Co.,Ltd., Shanghai, China

10 – 10:30 am – Break

10:30 – 11 am | A Versatile Component for Formulating Superior Air Compressor Lubricants

Yaokun Han, Dow Chemical, Shanghai, China

11 – 11:30 am | Performance Additives to Improve Tribological Properties of Ionic Liquid as Base Fluids

Erik Nyberg, Luleå university of technology, Luleå, Sweden, Mattias Grahn, Chemical Engineering, Luleå, Sweden, Ichiro Minami, Luleå University of Technology, Luleå, Sweden

11:30 am – Noon | Synthetics and Hydraulics Business Meeting

3I | Engine & Drivetrain I

8 – 8:30 am | Evolving Engine Lubrication to Meet Evolving Standards

Keith Snyder, Calumet Specialty Products Partners, L.P., Indianapolis, IN

8:30 – 9 am | Fuel Efficient Low Viscosity Lubricants

Stephen Hsu, Fei Zhao, Xiangyu Ge, The George Washington University, Washington, DC, Gefei Wu, Amol Savant, Valvoline LLC, Lexington, KY, Timothy Cushing, GMC LLC, Warren, MI

9 – 9:30 am | The Effect of the Driving Cycle in the Fuel Economy Measurement With MoDTC in Low Viscosity Engine Oils

Kenji Yamamoto, ADEKA Corporation, Tokyo, Japan, Sascha Heiden, ADEKA Europe GmbH, Dusseldorf, Germany, Yukiya Moriizumi, ADEKA Corporation, Tokyo, Japan

9:30 – 10 am | Correlating the Effect of Lubricant Temporary Shear Thinning to Shear Rates in Engines and its Impact on Lubricant Design for Improved Fuel Economy

Priyanka Desai, Shell Global Solutions (US) Inc., Houston, TX

10 – 10:30 am – Break

10:30 – 11 am | Improving Vehicle Fuel Efficiency Through High VI Engine Oils

Boris Eisenberg, Evonik Oil Additives, Darmstadt, Germany

11 – 11:30 am | The Effect of Friction Modifiers and Additive Packages on Friction Reduction Potential of Next Generation Engine Oils: Part I. Fresh Oils

Zhiqiang Liu, Arup Gangopadhyay, Steven Simko, Ford Motor Company, Dearborn, MI, Bill Lam, Mark Devlin, Afton Chemical Corporation, Richmond, VA

11:30 am – Noon | The Effects of Friction Modifiers and Additive Package on Friction Reduction Potential of Next Generation Engine Oils: Part II Aged Oils

Arup Gangopadhyay, Zhiqiang Liu, Steven Simko, Ford Motor Company, Dearborn, MI, Bill Lam, Mark Devlin, Afton Chemical Corporation, Richmond, VA

3J | Tribotesting III

8 – 8:30 am | Abrasive Wear of Advanced Polymeric Coatings at Elevated Temperature for Oil & Gas Drilling Applications

Pixiang Lan, Andreas Polycarpou, Texas A&M University, College Station, TX

8:30 – 9 am | Tribological Testing of Food: Mouthfeel and Stribeck Curves

Charlotte Reppich, Kartik Pondicherry, Anton Paar GmbH, Graz, Austria

9 – 9:30 am | Investigation of Stick-slip of Steel-polymer Contacts

Kartik Pondicherry, Florian Rummel, Anton Paar GmbH, Graz, Austria, Florian Summer, Montanuniversität Leoben, Graz, Austria

9:30 – 10 am | The Tribology Laboratory: A Handy Environment for Failure Analysis?

Philip De Vaal, University of Pretoria, Pretoria, South Africa

10 – 10:30 am – Break

10:30 – 11 am | Seizure Load Determination as a Challenge in Modern Model Tests on the Translatory Oscillation Tribometer (SRV®)

Gregor Patzer, Optimol Instruments Prueftechnik GmbH, Munich, Germany

11 – 11:30 am | An In Situ Approach to Study Tribocorrosion of a Supermartensitic Steel

Renata Soares, Vanessa Lins, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil, Hong Liang, Texas A&M University, College Station, TX

11:30 am – Noon | Experiments on the Mechanism of Liquid Penetration into Nut and Bolt Contacts and the Effect on Frictional Torque

Rob Dwyer-Joyce, Cyrus Parikhaah, Robin Mills, University of Sheffield, Sheffield, United Kingdom

3K | Ceramics & Composites I

8 – 8:30 am | Lubrication and Drag Reduce of Coiled Tubing in Hole Cleaning

Yanbao Guo, Huaping Xiao, China University of Petroleum, Beijing, China

8:30 – 9 am | Manufacture of Bio-Inspired Surface Texture Gradients Using Laser Processing to Enhance Tribological Performance

Michael Carrillo, Sydney Hale, Mathew Kuttolamadom, Texas A&M University, College Station, TX

9 – 9:30 am | Tribological Performance of Advanced Carbon-ceramics Composite Materials

M. Cinta Lorenzo Martin, Oyelayo Ajayi, Dileep Singh, Argonne National Laboratory, Lemont, IL

9:30 – 10 am | Ceramics & Composites Business Meeting

10 – 10:30 am – Break

4A | Nanotribology III

2 – 3 pm | Invited Talk

Sergei Kalinin, Oak Ridge National Laboratory, Oak Ridge, TN

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Measurements of Thicknesses Dependent Friction on Few-layer MoS_2, WS_2, and WSe_2

Liang Fang, Dameng Liu, The State Key Laboratory of Tribology,Tsinghua University, Beijing, China

4:30 – 5 pm | Water-induced Friction Hysteresis on Two Dimensional Films

Philip Egberts, Peng Gong, Lin Yuan, University of Calgary, Calgary, Alberta, Canada

5 – 5:30 pm | Humidity and Material Dependence of Nanoscale Friction for 2D Solid Lubricants

Robert Carpick, Kathryn Hasz, Han Ye, University of Pennsylvania, Philadelphia, PA, Zhijiang Ye, Miami University, Oxford, OH, Ganghee Han, A.T. Johnson, University of Pennsylvania, Philadelphia, PA, Ashlie Martini, University of California-Merced, Merced, CA

5:30 – 6 pm | Nanotribology Business Meeting

4B | Commercial Marketing Forum IV

2 – 2:30 pm | Afton Chemical Corporation

2:30 – 3 pm | Afton Chemical Corporation

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Sasol North America, Inc.

4:30 – 5 pm | Chemtura Corporation

5 – 5:30 pm | Available Slot

5:30 – 6 pm | Vanderbilt Chemicals, LLC

4C | Metalworking IV

2 – 2:30 pm | Developing New Formulation Backbones for Metalworking Fluids: Addressing the Many Challenges Faced by the Industry

Claude Hedoire, Solvay, Aubervilliers, France

2:30 – 3 pm | Self Emulsifier Lubricity Booster for Metalworking Fluid

Keihann Yavari, Arthur Coen, Oleon, Compiègne Cedex, France

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Water Soluble IF-WS_2 Nanoparticle Base Lubricant for Metalworking Applications

Girija Chaubey, George Diloyan, Nanotech Industrial Solutions, Avenel, NJ

4:30 – 5 pm | Coefficients of Friction Between Chip and Cutting Tool in Near-dry Milling Processes

Feng Jiang, NIngchang Wang, Lan Yan, Huaqiao University, Xiamen, China

5 – 5:30 pm | Study of Contamination and Performance of Biodegraded Cutting Fluids

Marcília Finzi, Alisson Rocha Machado, Federal University of Uberlandia, Uberlandia, Brazil, Emmanuel O. Ezugwu, Air Force Institute of Technology, Kaduna, Nigeria, Rosineide M. Ribas, Paulo P Gontijo Filho, Federal University of Uberlandia, Uberlandia, Brazil

5:30 – 6 pm | Tribological Properties of Titanium Alloys Under Lubrication of Oil and Aqueous Solutions

Ye Yang, Jianbin Luo, State Key Laboratory of Tribology, Tsinghua University, Beijing, China

6 – 6:30 pm | MWF Business Meeting

4D | Materials Tribology IV

2 – 2:30 pm | Sliding Speed Dependent Tribochemical Wear of Single Crystal Silicon in Humid Air and in Water

Lei Chen, Tribology Research Insititute, Chengdu, China, Seong Kim, Department of Chemical Engineering and Materials Research Institute, Univeristy Park, PA, Linmao Qian, Tribology Research Insititute, Chengdu, China

2:30 – 3 pm | Tribochemistry of GaN

Guosong Zeng, Lehigh University, Bethlehem, PA, Xiaofang Yang, Princeton University, Princeton, NJ, Damir Borovac, Lehigh University, Bethlehem, PA, Chee-Keong Tan, Clarkson University, Potsdam, NY, Bruce Koel, Princeton University, Princeton, NJ, Nelson Tansu, Brandon Krick, Lehigh University, Bethlehem, PA

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Nanoscale Tribocatalytic Reaction Driven Superlubricity at Macroscale

Anirudha Sumant, Diana Berman, Badri Narayanan, Subramanian Sankaranarayanan, Mathew Cherkara, Alexander Zinovev, Ali Erdemir, Argonne National Laboratory, Argonne, IL

4:30 – 5 pm | Effective Solid Lubrication via In-situ Formation of Ws_2 Tribofilms

Vladimir Totolin, Manel Rodriguez Ripoll, AC2T research GmbH, Wiener Neustadt, Austria

5 – 5:30 pm | Effects of Microstructure and Environment on the Run-In of MoS_2

John Curry, Lehigh University, Bethlehem, PA, Tomas Babuska, Nicolas Argibay, Michael Chandross, Sandia National Laboratories, Albuquerque, NM, Brandon Krick, Lehigh University, Bethlehem, PA

5:30 – 6 pm | Self-Adaptive Friction Behavior and Thermal Stability of $MoS_2/Sb_2O_3/C$ Coatings

Thomas Scharf, Tyler Torgerson, The University of North Texas, Denton, TX, Andras Korenyi-Both, Tribologix, Inc., Golden, CO

6 – 6:30 pm | Materials Tribology Business Meeting

4E | Surface Engineering II

2 – 2:30 pm | Mechano-chemical Surface Modification With Cu_2S: Inducing Superior Lubricity

Michael Varenberg, Georgia Institute of Technology, Atlanta, GA, Grigory Ryk, Alexander Yakhnis, Yuri Kligerman, Technion – Israel Institute of Technology, Haifa, Israel, Neha Kondekar, Matthew McDowell, Georgia Institute of Technology, Atlanta, GA

2:30 – 3 pm | Elastic-plastic Axisymmetric Sinusoidal Surface Asperity Contact

Swarna Saha, Robert Jackson, Auburn University, Auburn, AL

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Experimental Research on Transient Behavior of Cavitation Bubbles and Cavitation Pressure in Textured Thrust Bearings

Linqing Bai, Yonggang Meng, Tsinghua University, Beijing, China, Varian Zhang, Shell (Shanghai) Technology Ltd., Shanghai, China

4F | Fluid Film Bearings IV

2 – 2:30 pm | Case Study on Resolving Oil Whirl Issues on Gas Compressor

Sergey Drygin, Nicolas Peton, Pisut Lertsongkram, General Electric, Moscow, Russian Federation

2:30 – 3 pm | Investigation of the Effect of a Non-Isothermal Flow of the Non-Newtonian Fluid in a Thin Layer on the Dynamics of a Flexible Rotor of the Turbo-Machinery

Elena Zadorozhnaya, Igor Levanov, Nadezhda Khozeniuk, Vlad Khudyakov, South Ural State University, Chelyabinsk, Russian Federation

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Study on the Dynamics and Tribology Coupling Modeling of Three-screw Pump

Shuaiyu Zhou, Xiqun Lu, Hanfeng Lu, Wanyou Li, Harbin Engineering University, Harbin, Heilongjiang, China

4:30 – 5 pm | Dynamic Modeling of Floating Valve Plate Motion in an Axial Piston Pump

David Richardson, Farshid Sadeghi, Purdue University, West Lafayette, IN

5 – 5:30 pm | An Explicit Scheme for Large Models of Elastohydrodynamic Lubrication in Journal Bearings

Hiroki Fukagawa, Kazuyuki Yagi, Kyushu University, Fukuoka, Japan

5:30 – 6 pm | Fluid Film Bearings Business Meeting

4G | Lubrication Fundamentals II

Additives and Additive Degradation

2 – 2:30 pm | Wear From Biodiesel Oil-Dilution on IC-Engine Materials: A Preliminary Tribometer Study on the Effects of Biodiesel Components

Gustavo Molina, Valentin Soloiu, Emeka Onyejizu, Md Alam, Georgia Southern University, Statesboro, GA

2:30 – 3 pm | Impact of Renewable Group III+ Base Oil on the Energy Efficiency and Drain Interval of Industrial Gear Oil

Jeffrey Guevremont, American Refining Group, Bradford, PA, Paula Vettel, Hyeok Hahn, Novvi LLC, Emeryville, CA

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Tackifiers for High Temperature Lubricants

Daniel Vargo, Erik Willett, Functional Products Inc., Macedonia, OH

4:30 – 5 pm | Thermal Oxidation Characteristic of Ester Oils Based on Raman Spectroscopy

Bingxue Cheng, Dan Jia, Haitao Duan, Yongliang Jin, Jian Li, Wuhan Research Institute of Materials Protection, Wuhan, Hubei, China

5 – 6:30 pm | Lubrication Fundamentals Business Meeting

4H | Grease I

2 – 2:30 pm | A New Polyurea Thickener for Grease
Zhe Jia, John Cuthbert, Nathan Wilmot, Yifeng Liao, Dow Chemical, Freeport, TX

2:30 – 3 pm | On the Impact of Water on Grease Lubrication in Rolling Bearings
Piet Lugt, SKF Engineering and Research Centre, Nieuwegein, Netherlands, Febin Cyriac, Rob Bosman, University of Twente, Enschede, Netherlands

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Zero Leakage Grease for Speed Reduced Gear of Robots
Akihiro Shishikura, Idemitsu Kosan Co., Ltd., Ichihara, Chiba, Japan, Fumihiko Kusuyama, Idemitsu Kosan, Co., Ltd., Chiyoda-Ku, Tokyo, Japan

4:30 – 5 pm | The Effect of Water Ingress on Environmentally Adapted Greases
Johanna Larsson, Roland Ardai, Johan Leckner, Axel Christiernsson International AB, Nol, Sweden

5 – 5:30 pm | Assessment of Greases for Subsurface Rock Bit Bearing and Seal System with Improved Reliability
Mikey Benes, John Bomidi, Christopher Lane, Baker Hughes, The Woodlands, TX

4I | Engine & Drivetrain I

Special Session

2 – 3 pm | Engine & Drivetrain Special Session

3 pm – Exhibitor Appreciation Break

4J | Tribotesting IV

2 – 2:30 pm | Investigation of Hard Coating Roughness Modification & Impact on Coating Abrasiveness Sliding Against 52100 Steel
Gordon Krauss, Harvey Mudd College, Claremont, CA, Gary Doll, University of Akron, Akron, OH, Matthew Siniawski, Loyola Marymount University, Los Angeles, CA, Joseph Sinopoli, Andrea Vasquez, Harvey Mudd College, Claremont, CA

2:30 – 3 pm | Thermal Behavior and Cooling Conditions of Wet Multi-plate Clutches in Modern Applications
Anna Voelkel, Hermann Pflaum, Karsten Stahl, Technical University of Munich, Munich, Bavaria, Germany

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Tribological Characterization of Kerosene for Flight Applications
Greg Hansen, Peter Lee, Southwest Research Institute, San Antonio, TX, Matthew Billingsley, USAF, Edwards AFB, CA

4:30 – 5 pm | Investigation Comparing Gas-phase Synthesized Graphene to Graphene Platelets or Effectiveness as a Lubricant Additive
Gordon Krauss, Albert Dato, Harvey Mudd College, Claremont, CA, Matthew Siniawski, Loyola Marymount University, Los Angeles, CA, Andrea Vasquez, Joseph Sinopoli, Harvey Mudd College, Claremont, CA

5 – 5:30 pm | Research on the Lubrication Properties of Liquid Metal Ga0.64In0.24Sn0.12 Alloy
Aijie Xu, Tsinghua University, Beijing, China

5:30 – 6 pm | Tribotesting Business Meeting

4K | Condition Monitoring I

2 – 2:30 pm | Basic Oil Analysis
Michael Holloway, ALS Tribology, Highland Village, TX

2:30 – 3 pm | Business Case for Routine Fresh Oil Analysis
Nnamdi Achebe, Petrosave Integrated Services Ltd., Amuwo-Odofin, Lagos, Nigeria

3 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Dealing With Sampling Errors
Mohamad Sabzi, Ravan Net Pars, Tehran, Tehran, Iran (the Islamic Republic of)

4:30 – 5 pm | Friction and Wear Properties of WJ2 Sliding Bearing Material in Artificial Degradated Oil
Tomomi Honda, Yusuke Mochida, Eiki Kitahara, University of Fukui, Fukui, Fukui, Japan, Yumiko Nakamura, Chikako Takatoh, EBARA Corporation, Fujisawa, Kanagawa, Japan

4L | Rolling Element Bearings

Roundtable Discussion

2 – 3 pm | REB Round Table Topics Discussion

3 pm – Exhibitor Appreciation Break

4 – 5 pm | REB Round Table Topics Discussion

Wednesday, May 24, 2017

5A | Nanotribology IV

8 – 8:30 am | Effect of Roughness on Atomic Friction of Few-Layer Graphene
Zhijiang Ye, Miami University, Oxford, OH, Arda Balkanci, McGill University, Montreal, Quebec, Canada, Mehmet Baykara, Bilkent University, Ankara, Turkey, Ashlie Martini, University of California-Merced, Merced, CA

8:30 – 9 am | Lubricity of Gold Nanocrystals on Graphene Measured using Quartz Crystal Microbalance
Masahiro Ishigami, Michael Lodge, Brandon Blue, University of Central Florida, Orlando, FL, Ashlie Martini, University of California-Merced, Merced, CA

9 – 10 am | Invited Talk
Udo Schwarz, Yale University, New Haven, CT

10 – 10:30 am – Break

10:30 – 11 am | Detection of Interlayer Friction in Twisted Multilayer MoS_2 Based on Phonon Vibration
Ke Jin, Dameng Liu, The State Key Laboratory of Tribology,Tsinghua University, Beijing, China

11 – 11:30 am | Tribological Research of Few-Layer MoS_2 Based on First-Principles Calculation
Dameng Liu, Ke Jin, The State Key Laboratory of Tribology,Tsinghua University, Beijing, China, Liang Fang, Tsinghua University, Beijing, China

11:30 am – Noon | Effect of Surface-Coating Biomolecules on the Resistive Pulses of Nanoparticles Translocating Nanopores
Jing Shi, Ming Zhou, Tsinghua University, Beijing, China

5B | Commercial Marketing Forum V

8 – 8:30 am | Available Slot

8:30 – 9 am | The Dow Chemical Company

9 – 9:30 am | The Lubrizol Corporation

9:30 – 10 am | Afton Chemical

10 – 10:30 am – Break

10:30 – 11:00 am | The Lubrizol Corporation

11:00 – 11:30 am | Nease Company

11:30 – Noon | Available Slot

5C | Rolling Element Bearings I

Rolling Contact Fatigue I

8 – 8:30 am | Effect of Differential Hardness on Static Load Capacity of AISI 52100 Bearing Steel

Iqbal Shareef, Bradley University, Peoria, IL, Erwin Zaretsky, NASA Glenn Research Center, Cleveland, OH, Shruti Gour, Josh Brandis, Bradley University, Peoria, IL

8:30 – 9 am | Effect of Gradations in Elastic Modulus and Residual Stresses on Rolling Contact Fatigue Life of Case-hardened Bearing Steels

Nagaraj Arakere, Nikhil Londhe, Ghatu Subhash, University of Florida, Gainesville, FL

9 – 9:30 am | EHL Modeling of Polycrystalline Anisotropy Effects on Rolling Contact Fatigue Stresses

Neil Paulson, Farshid Sadeghi, Purdue University, Lafayette, IN

9:30 – 10 am | Niti Bearing Alloys: Mechanisms Governing Lubrication, Resilience and Hardness

Christopher DellaCorte, NASA, Cleveland, OH

10 – 10:30 am – Break

10:30 – 11 am | Propagation of Surface Initiated Rolling Contact Fatigue Cracks: Influencing Factors and Potential Mechanisms

Amir Kadiric, Pawel Rycerz, Imperial College London, London, United Kingdom, Guillermo Morales-Espejel, SKF Engineering and Research Centre, Nieuwegein, Netherlands

11 – 11:30 am | Rolling Contact Fatigue Life Prediction Under Elastic-plastic Loading Conditions

Nagaraj Arakere, Nikhil Londhe, Ghatu Subhash, University of Florida, Gainesville, FL

11:30 am – Noon | A Model to Represent High Level of Reliability in Bearings

Mevel Bruno, NTN-SNR, Annecy, France

5D | Materials Tribology V

8 – 8:30 am | Mechanochemistry of Physisorbed Molecules at Tribological Interfaces: Molecular Structure Dependence of Tribochemical Polymerization

Xin He, Seong Kim, The Pennsylvania State Univeristy, University Park, PA

8:30 – 9 am | Evaluating Transfer Film Wear Rates of Polymeric Solid Lubricants

Diana Haidar, University of Delaware, Newark, DE, Jiaxin Ye, Hefei University of Technology, Hefei, Anhui, China, Nikolay Garabedian, David Burris, University of Delaware, Newark, DE

9 – 9:30 am | Ultra Low Wear of Fluoropolymer Composites and the Potential Link to Microstructure

Morgan Jones, Juan Manuel Uruena, Samuel Hart, Andrew Cooper, Angela Pitenis, Gregory Sawyer, University of Florida, Gainesville, FL

9:30 – 10 am | Fluoropolymer and Alumina Composites: Tribochemistry and Ultralow Wear

Mark Sidebottom, Lehigh University, Bethlehem, PA

10 – 10:30 am – Break

10:30 – 11 am | Sliding Induced Solute Transport Into Articular Cartilage

Axel Moore, Brian Graham, Christopher Price, David Burris, University of Delaware, Newark, DE

11 – 11:30 am | Slip and Flow: Competition in a Hydrogel-glass Interface

Alison Dunn, Erik Reale, University of Illinois at Urbana, Urbana, IL

11:30 am – Noon | Shear-induced Fluorescence in Hydrogels

Angela Pitenis, Christopher Kabb, Juan Manuel Urueña, Wyatt Ebert, Sean Niemi, Brent Sumerlin, Thomas Angelini, Greg Sawyer, University of Florida, Gainesville, FL

5E | Surface Engineering III

8 – 8:30 am | Tribological Characteristics of En-19 & 16mncr$_5$ Steel Under Varying Roughness and Lubrication

Vivek Chacko, Zulfiqar Khan, Bournemouth University, Poole, Dorset, United Kingdom

8:30 – 9 am | Prediction and Prognostics of Surface Failures through Sensing Technologies within Large Mobile Assets

Adil Saeed, GCET College of Engineering and Technology, Muscat, Oman, Zulfiqar Khan, NanoCorr Energy and Modelling Research Group, Bournemouth, Dorset, United Kingdom, Tasheen Rafik, GCET College of Engineering and Technology, Muscat, Oman

9 – 9:30 am | Characterizing Nanoscale Surface Roughness Using Transmission Electron Microscope

Subarna Khanal, Abhijeet Gujrati, Tevis Jacobs, University of Pittsburgh, Pittsburgh, PA

9:30 – 10 am | An Experimental Study and Modelling of Tribo-corrosion Behaviour of Ni-graphene Nano Composite Coatings for Industrial Applications

Mian Hammad Nazir, Zulfiqar Khan, Bournemouth University, Bournemouth, Dorset, United Kingdom

10 – 10:30 am – Break

10:30 – 11 am | High Corrosion Resistance of AISI 304 Bearings by Ultrasonic Nanocrystalline Surface Modification Technique

Young-Sik Pyun, Auezhan Amanov, Bakhtiyor Urmanov, Jun-Hyong Kim, Sun Moon University, Asan, Republic of Korea

11 – 11:30 am | An Analysis of Generated Fractal and Measured Rough Surfaces in Regards to Their Multi-scale Structure and Fractal Dimension

Xiaohan Zhang, Yang Xu, Robert Jackson, Auburn University, Auburn, AL

11:30 am – Noon | Slurry Erosive Wear Behaviour of Al6061 Plasma Sprayed with Titania

Ramesh Chinnakurli, Alliance University, Bangalore, Karnataka, India, Suresh Kumar R, Arun P, Pradyot Satyappanavar, BMSCE, Bangalore, India, Zulfiqar Khan, Bournemouth, Bournemouth, United Kingdom

5F | Fluid Film Bearings V

8:30 – 9 am | Experimental Study of the Influence of the Misalignment Induced by Scratches on the Performance of a Two-lobe Journal Bearing

Jean Bouyer, Michel Fillon, Pprime Institute, Futuroscope Chasseneuil Cedex, France

9 – 9:30 am | Experimental Analysis of the Hydrodynamic Effect During Start-up of Fixed Geometry Thrust Bearings

Yann Henry, Jean Bouyer, Michel Fillon, Pprime Institute, Futuroscope Chasseneuil Cedex, France

9:30 – 10 am | Coupling Analysis on Dynamics and Tribology of Crankshaft-bearing Statically Indeterminate System Considering Misalignment

Liang Zhang, Xiqun Lu, Jianglong Luo, Fuzhan Huang, Harbin Engineering University, Harbin, China

10 – 10:30 am – Break

10:30 – 11 am | TEHD Performance of Fluid Film Bearings Supporting Highly Loaded Gears in Epicyclic Transmission Systems – Influence of Gear Tooth Geometry

Bálint Pap, Michel Fillon, Université de Poitiers – Pprime Institute , Levallois-Perret, France

11 – 11:30 am | Performance Characteristics of Non-circular Floating Ring Bearing

Sandeep Soni, D. P. Vakharia, SVNIT, Surat, Gujarat, India

11:30 am – Noon | Thrust Bearing Enabled with Water Cooling within the Pad: An Experimental Study

Najar Farooq, National Institute of Technology , Srinagar, J&K, India

5G | Lubrication Fundamentals III

EHL Modeling and Evaluation

8 – 8:30 am | Analysis of the Elasto-hydrodynamic Lubrication in Coated Finite Length Line Contacts

Shivam Alakhramsing, Matthijn de Rooij, Dik Schipper, Faculty of Engineering Technology, University of Twente, Enschede, Overijssel, Netherlands, Mark van Drogen, DAF Trucks N.V., Eindhoven, Noord-Brabant, Netherlands

8:30 – 9 am | EHL Analysis with Presence of Shear Band

Coda Pan, Illinois Institute of Technology, Millbury, MA, Michael Khonsari, Louisiana State University, Baton Rouge, LA

9 – 9:30 am | Exploring Elasto-Hydrodynamic Lubrication using a Finite Volume CFD Based Method

Damon Lee, Daniele Dini, Amir Kadiric, Imperial College London, London, United Kingdom

9:30 – 10 am | Advantages and Disadvantages of Variational Approach to Hyrdodynamic Lubrication Therory

Alexey Kornaev, Elena Kornaeva, Leonid Savin, Oryol State University I.S. Turgenev, Oryol, Russian Federation

10 – 10:30 am – Break

5G(A) | Lubrication Fundamentals III

Molecular Dynamics

10:30 – 11 am | Spreading Kinetics of Ultra-thin Polymer-based Lubricant Films using Molecular Dynamics

Brooklyn Noble, Bart Raeymaekers, University of Utah, Salt Lake City, UT

11 – 11:30 am | Study on the Lubricant Transfer at the Head-disk Interface in Hard Disk Drive using Molecular Dynamics Simulations

Jingan Song, Chang-Dong Yeo, Texas Tech University, Lubbock, TX

11:30 am – Noon | Open Slot

5H | Wear I

8 – 8:30 am | Wear Effects Assessment of Alumina Nanofluids in a Through-Flow Test-Rig

Gustavo Molina, Kenshantis Martin, Fnu Aktaruzzaman, Valentin Soloiu, Mosfequr Rahman, Georgia Southern University, Statesboro, GA

8:30 – 9 am | Hot Nano-Indentation Modeling of High Temperature Ni-Alloys

Sepehr Salari, Ali Beheshti, Lamar University, Beaumont, TX

9 – 9:30 am | Wear-Based Frictional Law for Simulation of Ballast Tracks

Mathieu Renouf, CNRS – University of Montpellier, Montpellier, France, Yves Berthier, CNRS – University of Lyon, Villeurbanne, France

9:30 – 10 am | Experimental Investigation of Material Removal Mechanism of Single Crystal Sapphire in Single Diamond Grit Scratching

Hui Huang, Qingxu Lin, Feng Jiang, Xipeng Xu, Huaqiao University, Xiamen, China

10 – 10:30 am – Break

10:30 – 11 am | Ultrasmooth Submicrometer Carbon Spheres as Lubricant Additives for Friction and Wear Reduction

Abdullah Alazemi, Farshid Sadeghi, Purdue University, West Lafayette, IN

11 – 11:30 am | Friction and Wear Mechanism of Metallic Glasses with Ionic Liquids as a Lubricant

Jaeho Lee, Chang-Dong Yeo, Texas Tech University, Lubbock, TX

11:30 am – Noon | A New Insight into the Interfacial Mechanisms of the Tribofilm Formed by Zinc Dialkyl Dithiophosphate

Pourya Parsaeian, University of Leeds, Leeds, United Kingdom

5I | Grease II

8 – 8:30 am | On the Relationship Between Grease Formulation and Friction in Rolling-sliding Concentrated Contacts

Nicola De Laurentis, Philippa Cann, Amir Kadiric, Imperial College London, London , United Kingdom, Piet Lugt, SKF Engineering and Research Centre, Nieuwegein, Netherlands

8:30 – 9 am | The Effect of Polymeric Additives on Grease Performance

Gaston Aguilar, Afton Chemical Corporation, Richmond, VA

9 – 9:30 am | Additive Technology to Improve the Grease Making Process

Gareth Fish, The Lubrizol Corporation, Wickliffe, OH

9:30 – 10 am | Effects of Li Grease Components on Radial Ball Bearing Torque and Their Properties

Kazumi Sakai, David Kostal, Brno University of Technology, Brno, Czech Republic, Yuji Shitara, JX Nippon Oil & Energy Corporation, Yokohama, Japan, Motohiro Kaneta, Ivan Krupka, Martin Hartl, Brno University of Technology, Brno, Czech Republic

10 – 10:30 am – Break

10:30 – 11 am | Polypropylene: A Thickener Technology with Many Surprises

Johan Leckner, René Westbroek, Axel Christiernsson International AB, Nol, Sweden

11 – 11:30 am | Rust for the Record: Significant Factors Affecting Corrosion Protection in Grease

Joseph Kaperick, Gaston Aguilar, Afton Chemical Corporation, Richmond, VA

11:30 am – Noon | Open

5J | Tribochemistry I

(Joint Session)

8 – 8:30 am | Mechanochemical Behaviour of ZDDP

Hugh Spikes, Jie Zhang, Imperial College London, London, United Kingdom

8:30 – 9 am | Sliding Evolution of the Chemical and Mechanical Properties of the Tribofilms Formed From Low- and High-saps Oils and ZDDP on Steel, H-DLC and Si-DLC

Somayeh Akbari, Mitjan Kalin, Eva Oblak, Ljubljana University, Ljubljana, Slovenia

9 – 9:30 am | In-situ Raman Investigation of Tribofilm Formation and Degradation During Boundary Friction

Jean-Louis Mansot, Jean-Wilner Petit, Audrey Molza, Yves Bercion, Université des antilles, Pointe a Pitre, Guadeloupe, France

9:30 – 10 am | The Effect of Lubricant Environments on Hydrogen Embrittlement

Joshua Seetanah, Monica Ratoi, University of Southampton, Southampton, Hampshire, United Kingdom

10 – 10:30 am – Break

10:30 – 11 am | Surface Passivation and Boundary Lubrication of Self-mated Tetrahedral Amorphous Carbon Asperities Under Extreme Tribological Conditions

Michael Moseler, Pedro Romero, Lars Pastewka, Fraunhofer Institute for Mechanics of Materials, Freiburg, Germany

11 – 11:30 am | Contacts Between Nanoparticles Investigation by In Situ Nano-tribologic Experiments in Environmental Stem

Jean-Louis Mansot, Andi Mikosch Cuka, Yves Bercion, Université des Antilles, Pointe a Pitre, Guadeloupe, France, Philippe Bilas, GTSI Université des Antilles, Pointe a Pitre, Guadeloupe, France

11:30 am – Noon | Linking Microstructure to Wear-induced Pitting Corrosion in Aged 2507 Super Duplex Stainless Steel

J. Michael Shockley, Kathryn Wahl, US Naval Research Lab, Washington, DC, Derek Horton, Chemistry Division, Center for Corrosion Science and Engineering Branch, US Naval Research Lab, Washington, DC

5K | Non-Ferrous Metals I

(Working)

8 – 8:30 am | Evaluation of Lubricants for Forming Al Alloys

Taylan Altan, The Ohio State University, Columbus, OH, Taylan Altan, Professor David Diaz, GRA, Center for Precision Forming, The Ohio State University

8:30 – 9 am | The Effect of Temperature on the Tribological Behavior of Tungsten Disulphide and Graphene Oxide in Aluminum-on-Steel Contact

Olufisayo Gali, Afsaneh Edrisy, Reza Riahi, University of Windsor, Windsor, Ontario, Canada

9 – 9:30 am | Testing Criteria in the Additive Selection for MWF Involving Aluminum Alloys

John Nussbaumer, Dover Chemical Corporation, Dover, OH

9:30 – 10 am | Investigation of Lubricity Additives for Chlorinated Paraffin Replacement on Aluminum in Boundary and Mixed/EHL Regimes

Yixing (Philip) Zhao, Alexandra Goode, Houghton International, Norristown, PA

10 – 10:30 am – Break

10:30 – 11 am | A New Generation of Phosphate-esters for Non-ferrous Metals Machining: Balancing Performance, Labeling & Economics

Claude Hedoire, Solvay, Aubervilliers, France

11 – 11:30 am | Nanotribology of a Catechol-Functionalized Alkane with Terminal Chain Branching

Marina Ruths, University of Massachusetts Lowell, Lowell, MA, Karin Persson, SP Technical Research Institute of Sweden, Stockholm, Sweden

5L | Gears I

8 – 8:30 am | Experimental Evaluation and Microscopic Analysis of Surface Coatings for Scuffing Resistance in Rotorcraft Gear Steels

Mark Riggs, Stephen Berkebile, Nikhil Murthy, Army Research Lab, Aberdeen Proving Ground, MD, Andras Korenyi-Both, Tribologix Inc., Golden, CO

8:30 – 9 am | Influence of a DLC Coating on the Temperature and Friction in a Helical Tooth Flank Contact

Ronny Beilicke, Lars Bobach, Dirk Bartel, Otto von Guericke University Magdeburg, Magdeburg, Germany

9 – 9:30 am | Preliminary Investigations on the Influence of Micropitting on Friction

Thomas Touret, Lamcos – Ecam, Villeurbanne, Rhone, France, Fabrice Ville, Lamcos, Villeurbanne, Rhone, France, Christophe Changenet, ECAM, Lyon, Rhone, France

9:30 – 10 am | Improved Calculation of Load-Dependent Gear Losses by Consideration of so far Disregarded Influences

Thomas Jurkschat, Thomas Lohner, Karsten Stahl, Technical University of Munich, Garching, Germany

10 – 10:30 am – Break

10:30 – 11 am | Onset & Progression of Micropitting Damage in Gear Teeth Contacts

Amir Kadiric, Pawel Rycerz, Imperial College London, London, United Kingdom, Guillermo Morales-Espejel, SKF Engineering and Research Centre, Nieuwegein, Netherlands

11 – 11:30 am | Influences on the Wear Behavior of Grease Lubricated Gears Operated with Dip and Spray Lubrication

Andreas Dobler, Thomas Tobie, Karsten Stahl, Technical University of Munich, Garching b. München, Germany

11:30 am – Noon | Analysis of Twin-disk Machine Experiments by Using Thermal Network Method

Gregoire Isaac, Jerome Cavoret, Fabrice Ville, INSA Lyon, Villeurbanne, France, Christophe Changenet, ECAM Lyon, Lyon, France, Guillaume Beck, Samuel Becquerelle, SAFRAN Transmission Systems, Colombes, France

5M | Condition Monitoring II

8 – 8:30 am | Using Oil Analysis to Trigger Wear Debris Analysis

Michael Holloway, ALS Tribology, Highland Village, TX

8:30 – 9 am | Operating Conditions That Shorten Gas Engine Oil Life

Nnamdi Achebe, Petrosave Integrated Services Ltd., Amuwo-Odofin, Lagos, Nigeria

9 – 9:30 am | Building a Championship Organization

Brett Minges, POLARIS Laboratories, Indianapolis, IN

9:30 – 10 am | Observance and Identification of an Unusual Contaminant in a Press Hydraulic System

John Duchowski, Timo Lang, Valerie Diehl-Klein, HYDAC FluidCareCenter, Sulzbach, Saar, Germany

10 – 10:30 am – Break

10:30 – 11 am | Estimating Overall Equipment Life through Rate of Wear

Bryan Debshaw, POLARIS Laboratories, Indianapolis, IN

11 – 11:30 am | Move Beyond the Individual Oil Analysis Result

Henry Neicamp, POLARIS Laboratories, Indianapolis, IN

6A | Nanotribology V

1:30 – 2 pm | Atomic-resolved Reaction Mechanisms for the ZDDP Thermal Film Formation on Steel, H-DLC and Si-DLC

Somayeh Akbari, Mitjan Kalin, Ljubljana University, Ljubljana, Slovenia

2 – 2:30 pm | Contribution of Shear Rate and Asperity-scale Surface Interactions on the Growth of ZDDP Tribofilms: An In-situ Atomic Force Microscopy Study

Harman Khare, Nitya Gosvami, Daniel Anderson, Andrew Jackson, Robert Carpick, University of Pennsylvania, Philadelphia, PA

2:30 – 3 pm | Nanoscale Investigation of the Surface Reactivity of Ionic Liquids

Pourya Parsaeian, University of Leeds, Leeds, United Kingdom

3 – 3:30 pm – Break

6B | Commercial Marketing Forum VI

1:30 – 2 pm | Available Slot

2 – 2:30 pm | The Lubrizol Corporation

2:30 – 3 pm | Available Slot

3 – 3:30 pm – Break

3:30 – 4 pm | The Lubrizol Corporation

4 – 4:30 pm | Available Slot

6C | Rolling Element Bearings II

Rolling Element Bearing Dynamics

1:30 – 2 pm | Simulation Based Design of a High-speed Tapered Roller Bearing

Alexander Hassis, Christian Brecher, Marcel Fey, RWTH Aachen University, Laboratory for Machine Tools and Production Engineering (WZL), Chair of Machine Tools, Aachen, Germany

2 – 2:30 pm | Combined EFEM-DEM Rotor-bearing System Modeling

Lijun Cao, Farshid Sadeghi, Purdue University, West Lafayette, IN, Lars-erik Stacke, SKF, Goteborg, Sweden

2:30 – 3 pm | NVH Calculation of Rolling Element Bearings – Effects of Roller Diameter Sorting of a TRB

Hannes Grillenberger, Schaeffler Technologies AG & Co.KG, Herzogenaurach, Germany

3 – 3:30 pm – Break

3:30 – 4 pm | Experimental Study of Cage Imbalance and Wear in Deep Groove Ball Bearing Under Cryogenic Environments

Yongbok Lee, Bokseong Choe, Korea Institute of Science and Technology, Seoul, Korea, Jeon-Kook Lee, Korea Institute of Science and Technology, Seoul, Korea

4 – 4:30 pm | Capacitances and Lubricant Film Thicknesses of Grease and Oil Lubricated Bearings

Alexander Furtmann, Norbert Bader, Leibniz Universitaet Hannover, Hannover, Germany, Hans Tischmacher, Siemens AG, Nuremberg, Germany, Gerhard Poll, Leibniz Universitaet Hannover, Hannover, Germany

4:30 – 5 pm | **Self-lubricating Composite Bearings: Dem Modeling of the Self-lubricating Cage Material**

Maria Villavicencio, Lamcos. Insa Lyon, Villeurbanne, Rhone-Alpes, France, Mathieu Renouf, Cnrs – University Of Montpellier, Montpellier, France, Aurelien Saulot , Lamcos. Insa Lyon, Villeurbanne, Rhone-Alpes, France, Yann Michel, Cnes. French Space Agency, Toulouse, France, Yves Maheo, Skf Aerospace, Châteauneuf-Sur-Isère, France, Guillaume Colas, Tobin Filleter, University Of Toronto, Toronto, Ontario, Canada, Yves Berthier, Lamcos. Insa Lyon, Villeurbanne, Rhone-Alpes, France

5 – 5:30 pm | **Rolling Element Bearing Business Meeting**

6D | Materials Tribology VI

1:30 – 2 pm | **Wear in Polymer Composite with Solid Lubricants for Cage of Cryogenic Ball Bearing**

Jeon-Kook Lee, Woo-Seok Seo, Bokseong Choe, Korea Institute of Science and Technology, Seoul, Korea, Yongbok Lee, Korea Institute of Science and Technology, Seoul, Korea

2 – 2:30 pm | **Effects of Blending Proportion on Tribological Properties of PI/UHMWPE Composites at High Working Environmental Temperature**

Song Chen, Jian Li, Lei Wei, Bingxue Cheng, Haitao Duan, Wuhan Research Institute of Materials Protection, Wuhan, Hubei, China

2:30 – 3 pm | **Wear and Friction Behaviour of a Lubricated Thermoset-pairing on a Ball-on-Three-Disks-Test**

Dominik Rocker, Thorsten Stoeberl, Yihao Zhu, Marco Vorbach, Mireia Gargallo, Robert Bosch GmbH, Stuttgart, Baden-Württemberg, Germany, Frank Mantwill, Helmut-Schmidt-University/University of German Federal Armed Forces, Hamburg, Germany

3 – 3:30 pm – Break

3:30 – 4 pm | **Topology Optimization of a Composite Surface Using a Level Set Method**

Tomas Grejtak, Mark Sidebottom, Xiu Jia, Lehigh University, Bethlehem, PA, Florian Feppon, Massachusetts Institute of Technology, Cambridge, MA, Natasha Vermaak, Brandon Krick, Lehigh University, Bethlehem, PA

4 – 4:30 pm | **Analysis the Influence of Asperities in Rough Surface of Optical Lens to its Subsurface Damage**

Zhiying Ren, Fuzhou University, Fuzhou, China

4:30 – 5 pm | **Rare Earth Silicate Phosphor and the Triboluminescence Properties in the Sliding Friction**

Qiang Zhou, China Agricultural University, Beijing , China

5 – 5:30 pm | **High Temperature Tube Fretting Wear Performance Against Cellulosic Wire Bushes**

Marcus Byron Huffman, GE Power Gas Power Systems, Greenville, SC, Kesavan Dhanasekaran, GE Global Research, Bangalore, India, Bangalore, India

6F | Surface Engineering IV

1:30 – 2 pm | **Polymer Brush Lubrication of Silicon Nitride on Steel Contacts: A Colloidal Force Microscopy Study**

Simon Watson, Ling Wang, Mengyan Nie, University of Southampton , Southampton, United Kingdom, Steven Hinder, University of Surrey, Guildford, United Kingdom, Keith Stokes, University of Southampton, Southampton, United Kingdom

2 – 2:30 pm | **Surface Engineering of Ti_6Al_4V Firewater Valves for the World's Largest Spar Gas Platform**

Vladimir Totolin, Vladimir Pejakovic, Manel Rodriguez Ripoll, AC2T Research GmbH, Wiener Neustadt, Austria

2:30 – 3 pm | **Load Induced Hydrodynamic Lubrication of Porous Polymers: An Explanatory Study of Underlying Mechanisms**

Shreyas Oak, Tushar Khosla, Noshir Pesika, Tulane University, New Orleans, LA

3 – 3:30 pm – Break

3:30 – 4 pm | **MoDTC-induced Wear of Hydrogenated DLC**

Shahriar Kosarieh, Ardian Morina, Anne Neville, University of Leeds, Leeds, United Kingdom

4 – 4:30 pm | **Solution of Three-dimensional Steady State Heat Conduction in Multilayered Materials**

Wenzhong Wang, Beijing Institution of Technology, Beijing, China

4:30 – 5 pm | **Faster, Lighter, and More Durable Si_3N_4 Ceramic by Ultrasonic Nanocrystalline Surface Modification Technique for Ceramic Bearing Applications**

Auezhan Amanov, Young-Sik Pyun, Sun Moon University, Asan, Korea

5 – 5:30 pm | **In-depth Studies of the In-Operando Formation of Amorphous Carbon Tribofilms at Lubricated Interfaces**

Giovanni Ramirez, Osman Eryilmaz, Argonne National Laboratory, Argonne, IL, Badri Narayanan, Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL, Yifeng Liao, Argonne National Laboratory, Argonne, IL, Ganesh Kamath, Subramanian Sankaranarayanan, Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL, Ali Erdemir, Argonne National Laboratory, Argonne, IL

5:30 – 6 pm | **Sliding Wear Behaviour of Mild Steel Coated with Titania Using Taguchi Approach**

Ramesh Chinnakurli, Alliance University, Bangalore, Karnataka, India, Suresh Kumar R, Nitish U, Prasidh N Kushavar, Anand Mani, BMSCE, Bangalore, India

6 – 6:30 pm | **A Review of Elastic-plastic Asperity Contact Mechanics**

Robert Jackson, Hamid Ghaednia, Xianzhang Wang, Swarna Saha, Yang Xu, Aman Sharma, Auburn University, Auburn University, AL

6G | Fluid Film Bearings VI

1:30 – 2 pm | **Combined Influence of Micropolar Lubricant and Textured Surface on the Performance of 3-Lobe Hole-entry Hybrid Journal Bearing System**

Satish Sharma, Chandra Khatri, Indian Institute of Technology, Roorkee, Roorkee, India

2 – 2:30 pm | **Elastohydrostatic Lubrication of Control Flow Valve (CFV) Compensated Hydrostatic Circular Thrust Pad Bearing Operating with Couple Stress Lubricant**

Satish Sharma, Vivek Kumar, Indian Institute of Technology, Roorkee, India

2:30 – 3 pm | **Hybrid Hydrostatic Bearing with Hydrodynamic Porous Media**

Hui-An Hsieh, Dein Shaw, Yi-Yun Chen, Yang-Jun Wang, National Tsing Hua University, Hsinchu City, Taiwan

3 – 3:30 pm – Break

3:30 – 4 pm | Design of a Hydrostatic Symmetric-pad Linear Bearing with the Membrane-type Restrictor

TaHua Lai, YaLu Yang, Shih-Chieh Lin, National Tsing Hua University, Hsinchu, Taiwan

4 – 4:30 pm | Development of a Design Environment for High-speed Air-bearing Spindles in Machine Tool Applications

Hua-Chih Huang, Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan, Farid Al-Bender, Hendrik Van Brussel, Katholieke Universiteit Leuven , Leuven (Heverlee), , Belgium

4:30 – 5 pm | Water-Lubricated Ceramic Hydrostatic Bearing for High-performance Machine Tool Spindle

Shuai Yan, Bin Lin, Wenbin Hu, Xiaofeng Zhang, Shumin Wan, Tianjin University, Tianjin, China

5 – 5:30 pm | Design and Test of Hydrostatic Built-in Grinding Spindle with Orifice Restrictors

Chun Hsien Chang, Shih-Chieh Lin, National Tsing Hua University, Hsinchu, Taiwan

6H | Lubrication Fundamentals IV

Novel Additives

1:30 – 2 pm | The Effects of ZDDP and Ionic Liquid Concentrations on Friction and Wear Behavior

Yan Zhou, Huimin Luo, Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN

2 – 2:30 pm | Ionic Liquids for the Lubrication of Steel-steel Contacts in Space Devices

Nicole Doerr, Nicholas Shore, AC2T research GmbH, Wiener Neustadt, Austria, Andreas Merstallinger, Roland Holzbauer, Aerospace & Advanced Composites GmbH, Wiener Neustadt, Austria

2:30 – 3 pm | Elastohydrodynamic Performance of a Non-corrosive Non-protonic Ioniq Liquid

Marcus Björling, Yijun Shi, Division of Machine Elements, Luleå, Sweden

3 – 3:30 pm – Break

3:30 – 4 pm | Processes in White Etching Crack Formation

Walter Holweger, Schaeffler Technologies AG , Herzogenaurach, Germany

4 – 4:30 pm | Wall-wetting Effects on the Tribological Performance of Cylinder Liner-piston Ring in Diesel Engines

Bifeng Yin, Bo Xu, School of Automotive and Traffic Engineering, Jiangsu University, Zhenjiang, China

6I | Wear II

1:30 – 2 pm | Modelling Electro - chemical and Mechanical Wear in a Tribocorrosive Wear Environment

Ali Ghanbarzadeh, University of Leeds, Leeds, United Kingdom

2 – 2:30 pm | A Thermal Investigation of Transfer Film Development and Wear Behavior of Polyetherether - ketone (PEEK) in Multi-Directional Sliding

Cris Schwartz, Mark Placette, Iowa State University, Ames, IA

2:30 – 3 pm | Physics-Based Computational Model to Predict Wear in Metallic Contacts

Arnab Ghosh, Sentient Science, Indianapolis, IN

3 – 3:30 pm – Break

3:30 – 4 pm | Analysis of Tool Wear Mechanism in High-speed Milling of Carbon Fiber Reinforced Polymer

Youxi Lin, Fuzhou University, Fuzhou, Fujian, China

4 – 4:30 pm | Wear of Brittle Material: Competition Between Mechanical, Electrical and Thermal Effects

Mathieu Renouf, CNRS – University of Montpellier, Montpellier, France, Chaoqun Zeng, University of Montpellier, Montpellier, France, Yves Berthier, CNRS – University of Lyon, Villeurbanne, France

4:30 – 5 pm | Evolution of Surface Topography for Running-in Process Under Mixed Lubrication Condition

Yazhao Zhang, Tsinghua University, Beijing, China, Yonggang Meng, Tsinghua University, Beijing, China

5 – 5:30 pm | Wear and Biotribology Business Meeting

6J | Grease III

1:30 – 2 pm | Approach to Evaluate Tribochemistry of Greases for Journal Bearings

Giovanni Ramirez, Argonne National Laboratory, Argonne, IL, John Bomidi, Mikey Benes, Christopher Lane, Baker-Hughes, The Woodlands, TX, Osman Eryilmaz, Ali Erdemir, Argonne National Laboratory, Argonne, IL

2 – 2:30 pm | 3D Study of Wear Scars Using Optical Profilometry

Nicole St Pierre, Nye Lubricants, Inc, Fairhaven, MA

2:30 – 3 pm | Grease Lubricated Fretting – Influence of Base Oil Viscosity and Material Combination

Elin Larsson, Uppsala University, Uppsala, Sweden Johan Leckner, René Westbroek, Axel Christiernsson International AB, Nol, Sweden, Åsa Rudolphi, Uppsala University, Uppsala, Sweden

3 – 3:30 pm – Break

3:30 – 4 pm | Modelling of Lubricating Grease Flow Using Computational Fluid Dynamics

Lars Westerberg, Luleå University of Technology, Luleå, Sweden

4 – 4:30 pm | Direct Probing of Lubricant Additives

Yunyun Chen, Carlos Sanchez, Texas A&M University, College Station, TX, Dilworth Parkinson, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA, Hong Liang, Texas A&M University, College Station, TX

4:30 – 5 pm | Open

5 – 5:30 pm | Grease Business Meeting

6L | Non-Ferrous Metals II

(Rolling)

1:30 – 2 pm | Selection of Rolling Oils and Additives: Lab Versus Reality

Patrick Deneuville, Constellium C-Tec, Voreppe, France

2 – 2:30 pm | The Use of a Pilot Mill for Development of Lubricants for Aluminum Rolling

Peter Schellingerhout, Quaker Chemical, Uithoorn, Netherlands

2:30 – 3 pm | Roll Cooling in Novelis Aluminum Hot and Cold Rolling Mills

Andrew Hobbis, Novelis Inc, Kennesaw, GA

3 – 3:30 pm – Break

3:30 – 4 pm | Rolling Aluminium Bright Products

Patrick Deneuville, Constellium C-Tec, Voreppe, France

4 – 4:30 pm | Analysis of Possible Separations Based on Product Distillation Ranges

Jason Bandy, Petrolink USA & Baron USA, Spokane, WA

6M | Gears II

1:30 – 2 pm | An Investigation on the Surface Texture Effect on Friction of a Point Contact

Sheng Li, Wright State University, Dayton, OH

2 – 2:30 pm | Deriving Energy Efficiency from Coal Mill Gear Box Lubricant

Anil Jaiswal, Indian Oil Corporation Limited, R&D Centre, Faridabad, Haryana, India

2:30 – 3 pm | Application Benefits of Polyglykols in Industrial Gear Oils

Andy Michael, Clariant Corporation, Mt. Holly, NC

3 – 3:30 pm – Break

3:30 – 4 pm | Some Approximate Analytical Solutions for Elasto-plastic Contacts

Laurentiu Moraru, University Politehnica of Bucharest, Bucharest, Bucharest, Romania, Theo Keith Jr., The University of Toledo, Toledo, OH

4 – 4:30 pm | New High Viscosity Basestock for Gear Applications

Nawid Kashani, BASF SE, Ludwigshafen am Rhein, Rhineland Pallatonia, Germany, Gene Zehler, BASF, Tarrytown, NY, Karolin Geyer, Frank Rittig, BASF SE, Ludwigshafen am Rhein, Rhineland Pallatonia, Germany, Philip Ma, BASF, Tarrytown, NY

6N | Condition Monitoring III

1:30 – 2 pm | Using Lubrication Failure for Spend Analysis and Specification Development

Michael Holloway, ALS Tribology, Highland Village, TX

2 – 2:30 pm | Predicting Asset Failures Using Data Analytics of Lubricating Oil

Brian Byrne, T.E. Laboratories, Tullow, Carlow, Ireland

2:30 – 3 pm | Condition Monitoring Business Meeting

3 – 3:30 pm – Break

6O | Biotribology I

3:30 – 4 pm | A Comparative Study on Enamel Microstructure and Mechanical Properties of Human Incisor and Molar

Jing Zheng, Liang Zheng, Jiapin Peng, Zhongrong Zhou, Southwest Jiaotong University, Chengdu, Sichuan, China

4 – 4:30 pm | Investigation into the Tribology of Toothbrushing

Richard Baker, Grace Hully, PCS Instruments, London, United Kingdom, Marc Masen, Imperial College, London, United Kingdom

4:30 – 5 pm | A Comparison Study on Lubricating Properties of Human and Bovine Saliva Absorption Films Forming on Different Enamels

Liang Zheng, Jing Zheng, Dongwen Liu, Zhongrong Zhou, Tribology Research Institute, Southwest Jiaotong University, Chengdu, Sichuan, China

5 – 5:30 pm | Open

6P | Engine & Drivetrain II

2 – 2:30 pm | The Tribological Response Under Slip-Rolling of Bismuth Compounds Versus Molybdenum Dithiocarbamate

Mathias Woydt, BAM, Berlin, Germany, John-Theodore Burbank, FUCHS Europe Schmierstoffe GmbH, Mannheim, Germany

2:30 – 3 pm | Development and Characterization of a High Surface Porosity Thermally Sprayed Coating

Hamed Ghaednia, Arup Gangopadhyay, Cliff Maki, James Boileau, Timothy Beyer, Caroline Mueller, Michael Marku, Ford Motor Company, Dearborn, MI

3 – 3:30 pm | Effect of Steel Hardness on Soot Wear

Artemis Kontou, Hugh Spikes, Imperial College London, London, United Kingdom

3:30 – 4 pm – Break

4 – 4:30 pm | The Effectiveness of Lubricant Additives in Preventing Soot Induced Wear

Ian Hobday, Oliver Rough, Aitziber Viadas, John Eastwood, Croda, New Castle, DE

4:30 – 5 pm | Use of Radioactive Tracer Technology to Investigation Wear in a 3.6L V6 Gasoline Engine

Peter Lee, Southwest Research Institute, San Antonio, TX, Varun Gauba, Tushar Bera, Jannik Reitz, Edward Nelson, Shell, Houston, TX, Greg Hansen, Craig Wileman, Southwest Research Institute, San Antonio, TX

5 – 5:30 pm | Friction and Wear Performance of Low-viscosity Synthetic Mixed Fluids

M. Cinta Lorenzo Martin, Ali Erdemir, George Fenske, Oyelayo Ajayi, Argonne National Laboratory, Argonne, IL

5:30 – 6 pm | Effect of Organic Friction Modifiers on Properties of Antiwear Film

Joanna Dawczyk, Hugh Spikes, Imperial College London, London, United Kingdom, Joe Russo, Shell Projects and Technology (US), Houston, TX

Thursday, May 25, 2017

7B | Metalworking V

8 – 8:30 am | Neat Oil Solution Stability and Maximum Additive Loading: A Metalworking Fluid Stability Study
Thomas Norrby, Linda Malm, Nynas AB, Nynashamn, Sweden

8:30 – 9 am | Metalworking Fluid Microbiology Basics Revisited
Frederick Passman, Biodeterioration Control Associates, Inc., Princeton, NJ

9 – 9:30 am | New Trends, Challenges and Innovation Solutions in Metal Cutting Fluids
Yixing (Philip) Zhao, Shilpa Beesabathuni , Houghton International, Norristown, PA

9:30 – 10 am | Sum-times Added Measures Make all The Difference: A Study of Additives in Mixture Formulation
Emil Schnellbacher, Lockhart Chemical – Additives International, Flint, MI

10 – 10:30 am – Break

10:30 – 11:00 am | Base Oil and Emulsifier Selection Principles Part II – A Metalworking Fluid Emulsion Stability Study
Thomas Norrby, Linda Malm, Nynas AB, Nynashamn, Sweden, Par Wedin, Naphthenics Research, Nynas AB, Nynashamn, Sweden

11 – 11:30 am | Organo Silicates and Silanes as Corrosion/Stain Inhibitors in MWF
Hoon Kim, Anna Tomaszewska, Peter Konopi, Chemetall, New Providence, NJ

11:30 am – Noon | Hot Rolling Oil for Steel Plants: A Case Study
Deepak Saxena, N Sivasurian, Simmi Datta, S Paul, R Mahapatra, R Suresh, Indian Oil Corporation Limited, Faridabad, Haryana, India

7C | Rolling Element Bearings III

EHL and Friction

8 – 8:30 am | Numerical Investigations on Drag of Cylinders in Cylindrical Roller Bearings
Yann Marchesse, Christophe Changenet, Ecam Lyon, Lyon, France, Fabrice Ville, LaMCoS INSA Lyon, Lyon, France

8:30 – 9 am | Traction in EHL Contacts Based on Local Temperature Measurements
Norbert Bader, Gerhard Poll, Leibniz University, Hannover, Germany

9 – 9:30 am | Development of a New Power Loss Model in Rolling Element Bearing
Dimitri Niel, Fabrice Ville, LaMCoS, Villeurbanne, France

9:30 – 10 am | Open

10 – 10:30 am – Break

10:30 – 11:00 am | Dynamic Simulation of the Interaction between Raceway and Rip Contact of Cylindrical Roller Bearings
Bernd Sauer, Timo Kiekbusch, University of Kaiserslautern, Kaiserslautern, Germany

11 – 11:30 am | Direct Observation of Lubricant Films in a Model Rolling Bearing
He Liang, Amir Kadiric, Imperial College London, London, United Kingdom

11:30 am – Noon | Numerical Investigations on Drag Coefficient of Circular Cylinder in Roller Bearings
Wenjun Gao, INSA de Lyon, Villeurbanne, Rhone, France, Daniel Nelias, INSA-Lyon, Villeurbanne, France, Zhenxia Liu, Northwestern Polytechnical University, Xi'an, China

7D | Tribochemistry II

(Joint Session)

8 – 9 am | Thermal and Shear Effects in Boundary Film Formation
Wilfred Tysoe, UW-Milwaukee, Milwaukee, WI

9 – 9:30 am | Tribology, Surface Chemistry and Morphology of Self-Healing Solid Lubricant Tribofilms Generated by Mechanochemical Surface Finishing
Boris Zhmud, Applied Nano Surfaces Sweden AB, Uppsala, Sweden

9:30 – 10 am | Study of Mechanisms of Action of Amine-based Friction Modifiers using Electronic Structure & Molecular Dynamics Simulations
Rafael Pereira de Matos, Toni Massoud, Clotilde Minfray, Franck Dahlem, Ecole Centrale de Lyon, Ecully Cedex, France, Manami Sato, Nozomu Hatakeyama, Tohoku University, Sendai, Japan, Sophie Loehlé, TOTAL Marketing & Services, Solaize, France, Akira Miyamoto, Tohoku University, Sendai, Japan, Manuel Cobian, Ecole Centrale de Lyon, Ecully Cedex, France

10 – 10:30 am – Break

10:30 – 11:00 am | Measuring Electro-mechano-chemical Oxidation and Reduction Reactions on Graphene Using AFM: Probing The Relationship Between Stress, Strain, & Reactivity at the Nanometer Scale
Jonathan Felts, Shivaranjan Raghuraman, Texas A&M University, College Station, TX

11 – 11:30 am | Tribological Behavior of Graphene Grain Boundaries on Single Crystal Copper Films
Pavlo Antonov, Joost Frenken, ARCNL, Amsterdam, Netherlands

11:30 am – Noon | Impacts of Nanoscale Roughness on the Tribochemical and Frictional Properties of Graphene and MoS_2
James Batteas, Texas A&M University, College Station, TX

7E | Seals I

8 – 8:30 am | Hydraulically Controlled Mechanical Seal for Reactor Coolant Pump

Richard Salant, Georgia Insitute of Technology, Dunwoody, GA

8:30 – 9 am | Influence of Coupled Rotordynamics on Mechanical Face Seal Performance

Itzhak Green, Phil Varney, Georgia Institute of Technology, Atlanta, GA

9 – 9:30 am | Using Mechanical Face Seal Vibration to Detect a Breathing Rotor Crack

Itzhak Green, Phil Varney, Georgia Institute of Technology, Atlanta, GA

9:30 – 10 am | A Numerical and Experimental Investigation of the Performance of a Compliant Finger Seal

Sara Kline, Minel Braun, The University of Akron, Solon, OH

10 – 10:30 am – Break

10:30 – 11:00 am | Analysis of the Lift-Off Speed of Water Lubricated Spiral Groove Seal

Noel Brunetiere, Andel Djamai, Institut Pprime – CNRS, Futuroscope, France

11 – 11:30 am | Effect of Lip Asperity Spatial Distribution on Mixed EHL in Radial Shaft Seals

Joichi Sugimura, Hiromichi Yoshimizu, Kyushu University, Fukuoka, Japan, Hirotaka Mizuta, NOK Corporation, Fujisawa, Kanagawa, Japan

11:30 am – Noon | New Method for Estimating the Sealing Quality of Rotating Seals

Veith Pelzer, IMKT – Institute of Machine Design and Tribology, Hannover, Germany

7F | Power Generation I

8 – 8:30 am | Mechanisms of Varnish Formation and Implications for the Use of Varnish Removal Technology

Matthew Hobbs, Peter Dufresne, EPT, Calgary, Alberta, Canada

8:30 – 9 am | New Management Approach for Turbine Oils in High Efficiency Turbines

James Dimas, Yuuhei Shirakura, Idemitsu, Southfield, MI, Shinji Aoki, Idemitsu Kosan Co., Ltd., Chiba, Japan

9 – 9:30 am | What Routine EHC Fluid Analysis Fails to Detect: Improved Phosphate Ester Maintenance Through Non-routine Testing

Matthew Hobbs, Peter Dufresne, EPT, Calgary, Alberta, Canada

9:30 – 10 am | New PAG Turbine Oil That Enable Easy Management

Shinji Aoki, Idemitsu Kosan Co., Ltd., Chiba, Japan

10 – 10:30 am – Break

10:30 – 11:00 am | Dirt – A Lethal Diesel Fuel Contaminant

Nnamdi Achebe, Petrosave Integrated Services Ltd., Amuwo-Odofin, Lagos, Nigeria

11 – 11:30 am | Keeping Lubricants and Wetted Parts in "As New" Condition

Axel Wegner, C.C.Jensen, Inc., Newnan, GA

7G | Lubrication Fundamentals V

EHL Modeling and Evaluation

8 – 8:30 am | Viscoelastic Response of Lubricant in an EHL Contact Under Transient Bi-Directional Shear Loading

Josef Fryza, Petr Sperka, Ivan Krupka, Martin Hartl, Brno University of Technology, Brno, Czech Republic

8:30 – 9 am | Study on the Onset of Lubricant Film Breakdown

Jonny Hansen, Marcus Björling, Division of Machine Elements, Luleå University of Technology, Luleå, Sweden, Erland Nordin, Hubert Herbst, Scania CV AB, Södertälje, Sweden, Braham Prakash, Division of Machine Elements, Luleå University of Technology, Luleå, Sweden, Bo Alfredsson, Royal Institute of Technology, Stocholm, Sweden, Roland Larsson, Division of Machine Elements, Luleå University of Technology, Luleå, Sweden

9 – 9:30 am | A Method for Lubricant Flow Measurement in an EHL Contact by Particle Tracking

Petr Sperka, Ivan Krupka, Martin Hartl, Brno University of Technology, Brno, Czech Republic

9:30 – 10 am | Pressure Dependence of Density for Some Typical Lubricants up to 1 GPa

Bo Zhang, Saga University, Saga-shi, Saga, Japan, Bo Zhang, Toshifumi Mawatari and Yohei Sakamoto, Graduate School of Science and Engineering, Saga University, Saga-shi, Japan

10 – 10:30 am – Break

7H | Wear III

8 – 8:30 am | Numerical Modeling and Analysis of Sub-surface Damage in the Cutting Process of Carbon Fiber Reinforced Plastic Composites

Youxi Lin, Fuzhou University, Fuzhou, Fujian, China

8:30 – 9 am | Status of Niobium Carbide (NbC) as a Substitute for Tungsten Carbide (WC) as Cutting Tools and for Wear Protection

Mathias Woydt, BAM, Berlin, Germany, Shuigen Huang, Jozef Vleugels, KU Leuven, Hervelee, Belgium, Hardy Mohrbacher, NIOBELCON BVBA, Schilde, Belgium

9 – 9:30 am | A Novel Method for the Determination of Wear of Engine Cylinder Liner Parts

Nicholaos Demas, Robert Erck, George Fenske, ANL, Argonne, IL

9:30 – 10 am | Time-dependent Analyses of Wear in Oscillating Bearing Applications

Fabian Schwack, Norbert Bader, Gerhard Poll, Leibniz Universität Hannover, Hannover, Lower Saxony, Germany

10 – 10:30 am – Break

10:30 – 11 am | Wear Prediction by Field Data

Mohamad Sabzi, Ravan Net Pars, Tehran, Tehran, Iran

7I | Synthetics & Hydraulics II

8 – 8:30 am | Can we Predict Vane Pump Wear with a Short Lab Test?
Emmanuel Georgiou, Dirk Drees, Michel De Bilde, Falex Tribology NV, Rotselaar, Belgium

8:30 – 9 am | Fluid Aeration Testing of Different Hydraulic Chemistries using an In-line Imaging Method
Ricardo Hein, Conexo, Acworth, GA, Salvatore Rea, Chemtura Corporation, East Hanover, NJ

9 – 9:30 am | Reverse Polarity Electro-static Discharge Signal Recorded in Fork Lift Truck Hydraulic Circuit
John Duchowski, Timo Lang, HYDAC FluidCareCenter GmbH, Sulzbach, Saar, Germany, Bhavbhuti Pandya, HYDAC Technology Corporation, Bethlehem, PA

9:30 – 10 am | Formulation and Application of Efficient Industrial Lubricants
Justin Langston, Evonik Oil Additives, Horsham, PA, Thorsten Bartels, Evonik Industries AG, Darmstadt, Germany, Thomas Schimmel, Evonik Oil Additives, Horsham, PA, Frank Olaf-Maehling, Michael Alibert, Evonik Industries AG, Darmstadt, Germany

10 – 10:30 am – Break

10:30 – 11 am | Alkylated Naphthalenes
Maureen Hunter, King Industries, Inc., Norwalk, CT

11 – 11:30 am | Performance of Lubricants Formulated with a New Group V Base Stock
Ian Hobday, Mandi McElwain, Gemma Stephenson, Croda, New Castle, DE

11:30 am – Noon | Studies on the Relationships of Molecular Structure and Properties for Metallocene Poly-alphaolefin (mPao) Based on A-olefins Made from Coal
Jiusheng Li, Jian Xu, Yuefeng Ma, Shanghai Advanced Research Institute, Shanghai, China

7J | Engine & Drivetrain III

8 – 8:30 am | Wear Performance of Used Heavy Duty Engine Oils
Mark Fowell, Lars Mattsson, Ahmed Zainelabdin, Volvo AB, Gothenburg, Sweden

8:30 – 9 am | ROBO: A Method to Generate Aged Oil for Low Temperature Viscosity Assessment for Current and Future Engine Oil Categories
Alan Flamberg, Justin Mills, Joan Souchik, Evonik Oil Additives, Horsham, PA

9 – 9:30 am | An Experimental Study of the Effects of Lubricants on Piston Ring Friction
Zach Westerfield, Dallwoo Kim, Tian Tian, Massachusetts Institute of Technology, Destin, FL

9:30 – 10 am | Weight-Optimized Bushingless Connecting Rods: Improving the Tribological Performance of a Gudgeon Pin/Connecting Rod System by using the Triboconditioning® Process
Boris Zhmud, Applied Nano Surfaces Sweden AB, Uppsala, Sweden

10 – 10:30 am – Break

10:30 – 11 am | Lube Oil Consumption (LOC) Measurement on Internal Combustion Engines
Bernhard Rossegger, Large Engines Competence Center GmbH, Graz, Styria, Austria

11 – 11:30 am | Modeling Research of Piston Ring Pack on Blowby and Lubrication in Marine Low-speed Diesel Engine
Naikun Wang, Xiqun Lu, Yanning Wang, Xiuyi Lv, Ping Ren, Harbin Engineering University, Harbin, Heilongjiang, China

11:30 am – Noon | The Study of the Friction Properties of Railroad Engine Oils
Yue-Rong Li, Brendan Miller, Chevron Oronite, Richmond, CA

7K | Non-Ferrous Metals III

(Biobased)

8 – 8:30 am | Recent Advances in the Development of the Isostearic Acid Process Using Environmentally Friendly & Cost Effective Approaches
Helen Ngo Lew, Majher Sarker, Renee Latona, Robert Moreau, Agricultural Research Service, Wyndmoor, PA

8:30 – 9 am | Polymercaptanized Soybean Oil – Properties and Tribological Characterization
Girma Biresaw, James Lansing, Grigor Bantchev, Rex Murray, USDA-ARS-NCAUR, Peoria, IL

9 – 9:30 am | Thermo-Oxidatively Improved Environmental Friendly Base Oils
P. V., Joseph, Deepak Saxena, Indian Oil Corporation Limited, Faridabad, Haryana, India

9:30 – 10 am | 17-Hydroxy Oleic Acid as Precursor for Unsaturated and Epoxy Fatty Acid Estolides: Application as Plasticizers in Poly(3-Hydroxybutyrate) Films
Richard Ashby, Daniel Solaiman, USDA/ARS/ERRC, Wyndmoor, PA

10 – 10:30 am – Break

10:30 – 11 am | Comparison of the Lubricity Performance of Micro and Macro Emulsions of Vegetable Oils and Their Derivatives on Aluminum and Steel Surfaces
Selim Erhan, ADM, Decatur, IL

7M | Biotribology II

8 – 8:30 am | Diamond-like Carbon Coatings with Zirconium Inter-layers for Biotribological Applications
Dipankar Choudhury, University of Arkansas, Fayetteville, AR, Juergen Lackner, Joanneum Research Forschungsgesellschaft Mbh, Leobner Strasse , Austria, Robert Fleming, Josh Goss, Jingyi Chen, Min Zou, University of Arkansas, Fayetteville, AR

8:30 – 9 am | Novel Friction Measurements of Intact Equine Articular Cartilage In Vitro
Lyndsey Hayden, Auburn University College of Veterinary Medicine, Auburn, AL, Robert Jackson, Auburn University, Auburn, AL, Sarah Escaro, R Reid Hanson, Auburn University College of Veterinary Medicine, Auburn, AL

9 – 9:30 am | Characterizing Membrane Dynamics at a Biological Interface

Tristan Hormel, Tapomoy Bhattacharjee, Angela Pitenis, Juan Manuel Urueña, Greg Sawyer, Thomas Angelini, University of Florida, Gainesville, FL

9:30 – 10 am | Viability of Corneal Epithelial Cells at the Air-Gel Interface

Christopher O'Bryan, Tristan Hormel, Tapomoy Bhattacharjee, Gregory Sawyer, Thomas Angelini, University of Florida, Gainesville, FL

10 – 10:30 am – Break

10:30 – 11 am | Preparation and Tribological Characterization of Biomimetic Patterned Polymer Textures as Skin Coating Models

Marina Ruths, Ruting Jin, Xin Xu, University of Massachusetts Lowell, Lowell, MA, Colette Cazeneuve, Jeanne Chang, Gustavo Luengo, L'Oreal Research and Innovation, Aulany Sous Bois, France

11 – 11:30 am | Direct Contact Induced Damage in Cellular Monolayers

Samuel Hart, Juan Manuel Uruena, Angela Pitenis, Kyle Schulze, Greg Sawyer, Thomas Angelini, University of Florida, Gainesville, FL

11:30 am – Noon | Cell Friction

Juan Manuel Urueña, Angela Pitenis, Kyle Schulze, Tapomoy Bhattacharjee, Tristan Hormel, Samantha Marshall, Samuel Hart, Eric McGhee, Alex Bennett, Thomas Angelini, Greg Sawyer, University of Florida, Gainesville, FL

8B | Metalworking VI

1:30 – 2 pm | Open Session

8C | Rolling Element Bearings IV

Rolling Contact Fatigue II

1:30 – 2 pm | Application of a Semianalytical Elastic – Plastic Rough Surface Contact Model to Interpret Experimental Observations of Rolling Contact Fatigue Damage

Achilleas Vortselas, Pawel Rycerz, Francesco Manieri, Amir Kadiric, Imperial College London, London, United Kingdom

2 – 2:30 pm | Rolling Contact Fatigue of Refurbished Case Carburized Bearings

Aditya Walvekar, Farshid Sadeghi, Purdue University, West Lafayette, IN

2:30 – 3 pm | Influence of Surface Micro-geometry on RCF: A Numerical Approach with a Microstructure Representative Model

Guillaume Vouaillat, LaMCoS – INSA Lyon, Villeurbanne, France, Jean-Philippe Noyel, LabECAM – ECAM Lyon, Lyon, France, Fabrice Ville, LaMCoS – INSA Lyon, Villeurbanne, France, Xavier Kleberf, MATEIS – INSA de Lyon, Lyon, France, Christophe Changenet, LabECAM – ECAM Lyon, Lyon, France, Sylvain Rathery, SAFRAN Transmission Systems – SAFRAN Group, Colombes, France

3 – 3:30 pm – Break

8D | Tribochemistry III

(Joint Session)

1:30 – 2 pm | Tribochemistry Under Boundary Lubrication

Stephen Hsu, The George Washington University, Washington, DC

2 – 2:30 pm | Influence of Morphologies of Synthetic Magnesium Silicate Hydroxide on Their Tribological Properties

Bin Wang, Qiuying Chang, Kai GAO, Beijing Jiaotong University, Beijing, China

2:30 – 3 pm | Comparative Tribological Properties of Synthetic Magnesium Silicate Hydroxide and Serpentine Powder as Lubricant Additive

Kai Gao, Qiuying Chang, Bin Wang, Beijing Jiaotong University, Beijing, China

3 – 3:30 pm – Break

3:30 – 4 pm | Coupling Between Refrigerant-surface Chemistry and Lubrication Conditions

Stéphane Tromp, LaMCoS – INSA Lyon, Villleurbanne, France, Laurent Joly, ILM, Villeurbanne, France, Manuel Cobian, LTDS – ECL, Lyon, France, Nicolas Fillot, LaMCoS – INSA Lyon, Villleurbanne, France

8E | Seals II

1:30 – 2 pm | Numerical Simulation of Surface Roughness Effects on the Mixed Lubrication Characteristics of Hydraulic Seals

Abdelhak Azzi, Institut Pprime, Futuroscope Chassenuil, France

2 – 2:30 pm | Numerical Analysis of the Hydrodynamic Characteristics of Viscoseal Running Under Different Steady Conditions in Laminar and Turbulent Flow Regime

Mohamed Jarray, Dominique Souchet , Yann Henry, Aurelian Fatu, Pprime institute, University of Poitiers, Poitiers, France

2:30 – 3 pm | Seals Business Meeting

3 – 3:30 pm – Break

8G | Lubrication Fundamentals VI

1:30 – 3:30 pm | Open Session

8H | Wear IV

1:30 – 2 pm | Effect of Lubricant on the Reliability of Cental Implant Abutment Screw Joint: An In-Vitro Laboratory and Three-Dimension Finite Element Analysis

Tingting Wu, Haiyang Yu, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, China, Chengdu, China

2 – 2:30 pm | Aging Effect of pH on the Mechanical and Tribological Properties of Dental Composite Resins

Tingting Wu, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, China, Chengdu, China, Haiyang Yu, State Key Laboratory of Oral Diseases, West China Hospital of Stomatology, Sichuan University, Chengdu, China

2:30 – 3 pm | Open

3 – 3:30 pm – Break

8I | Synthetics & Hydraulics III

1:30 – 2 pm | Tertiary-Alkyl Primary Amines (TAPA) as Building Blocks for Formulated Fluids

Gagan Srivastava, Ashish Kotnis, John Cuthbert, Andrew Larson, The Dow Chemical Company, Freeport, TX

2 – 2:30 pm | A Novel Microfluidic Rheometer to Quickly and Accurately Measure Viscosity of Concentrated Dispersions

Matt Vanden Eynden, Formulaction, Inc, Worthington, OH, Patrick Abgrall, Patrycja Adamska, Yoann Lefeuvre, Gerard Meunier, Formulaction, L'Union, France

2:30 – 3 pm | Tribological Performance of a New Type of Di-block Copolymers for Optimum Viscosity Modifications

Xingliang He, Michael Desanker, Jie Lu, David Pickens, Tracy Lohr, Northwestern University, Evanston, IL, Ning Ren, Xiurong Cheng, Frances Lockwood, Valvoline , Lexington, KY, Tobin Marks, Yip-Wah Chung, Qian Wang, Northwestern University, Evanston, IL

3 – 3:30 pm – Break

8J | Engine & Drivetrain IV

1:30 – 2 pm | Engine Oil Pumpability in a Modern Engine

Ricardo Gomes, Joan Souchik, Evonik Oil Additives, Horsham, PA, Thorsten Bartels, Claudia Meister, Evonik Industries AG, Darmstadt, Germany, Professor Russ, Hochschule Darmstadt, Darmstadt, Germany

2 – 2:30 pm | High Performance Engine Oil Formulated with Renewable Group III+ Base Oil – Part II: Field Testing

Paula Vettel, Novvi LLC, Emeryville, CA

2:30 – 3 pm | Friction Reduction in Modern Engines using Novel Lubricant Additives

Zhiqiang Liu, Ford Motor Company, Novi, MI, Farrukh Qureshi, Matt Gieselman, The Lubrizol Corp, Wickliffe, OH, Arup Gangopadhyay, Ford Motor Company, Novi, MI, Kevin Streck, The Lubrizol Corp, Wickliffe, OH, Steven Simko, Ford Motor Company, Novi, MI

3 – 3:30 pm – Break

3:30 – 4 pm | Investigations on Truck Axle Efficiency: Thermal Behaviour and Hypoid Gears Parameters Influence

Charlotte Fossier, Fabrice Ville, INSA de LYON – LaMCoS, Villeurbanne, France, Christophe Changenet, ECAM Lyon – LabECAM, Lyon, France, Denis Barday, Vincent Berier, Volvo Group – Renault Trucks, Saint Priest, France

4 – 4:30 pm | Optimization of a Polyalkylene Glycol Axle Lubricant Formulation

John Cuthbert, Ashish Kotnis, The Dow Chemical Company, Midland, MI, Arup Gangopadhyay, Nikolaus Jost, Chintan Ved, Ford Motor Company, Novi, MI, Ali Erdemir, Giovanni Ramirez, Argonne National Laboratory, Argonne, IL

8M | Biotribology III

1:30 – 2 pm | In Situ Measurement of the Dynamic Contact Interface of Hydrogels

Eric McGhee, Angela Pitenis, Juan Manuel Uruena, Kyle Schulze, Samuel Hart, Greg Sawyer, Thomas Angelini, University of Florida, Gainesville, FL

2 – 2:30 pm | The Development of Constant Pressure Probes for Low Pressure Applications

Samantha Marshall, Kyle Schulze, Juan Manuel Uruena, Eric McGhee, Angela Pitenis, Alexander Bennett, Samuel Hart, Christopher O'Bryan, Thomas Angelini, Greg Sawyer, University of Florida, Gainesville, FL

2:30 – 3 pm | Gels, Cells, and Mucin

Angela Pitenis, Juan Manuel Urueña, Tristan Hormel, Tapomoy Bhattacharjee, Samuel Hart, Alexander Bennett, Kyle Schulze, Samantha Marshall, Eric McGhee, Thomas Angelini, Greg Sawyer, University of Florida, Gainesville, FL

3 – 3:30 pm – Break

3:30 – 4 pm | Friction Instabilities in Gemini Hydrogel Contacts

Sean Niemi, Kyle Schulze, Angela Pitenis, Juan Manuel Uruena, Thomas Angelini, Greg Sawyer, University of Florida, Gainesville, FL

Share your STLE 2017 Annual Meeting Presentation With Submission of an Extended Abstract

Each year STLE's annual meeting is known for its exceptional technical content. With more than 500 papers to choose from, a major concern for attendees is scheduling conflicts or they cannot share materials with colleagues who are unable to attend the meeting.

In an effort to provide attendees with the opportunity of not missing a presentation, STLE encourages speakers to submit an optional 2-3 page extended abstract or provide digital copies of their presentation slides. We recommend speakers submit materials before **April 24, 2017**, to ensure materials are available to attendees before the meeting.

Extended abstracts or presentation slides must be submitted in PDF format and can be emailed to Karl Phipps at: **presentations@stle.org**. For more information about submission requirements, please visit **www.stle.org**.

STLE 2017 Annual Meeting & Exhibition Individual Registration Form

Hyatt Regency Atlanta | Atlanta, GA (USA) | May 21-25, 2017

In a hurry? Register online at www.stle.org

MAIL OR FAX THIS FORM TO: STLE, 840 Busse Highway, Park Ridge, IL (USA) 60068. Fax: 847-825-1456.

Registration Information (Please complete separate forms for each individual from your organization). • **My STLE Member # is:** _____

Title: ___ Mr. ___ Mrs. ___ Ms. ___ Dr. ___ Professor First name for badge: _____

First Name: _____ Last Name: _____

Company/Institution Name: _____

Address: _____

City: _____ State/Province: _____ Zip/Mail Code: _____

Country: _____ E-mail: _____

Phone: _____ Fax: _____

❑ **Speaker or Presenter?** Session Number or Paper Title: _____

NOTE: Registration includes technical sessions, trade show admission, Networking Reception, Commercial Marketing Forum, plus one complimentary ticket to the Presidents Luncheon. Education courses are $315 with full meeting registration except ABMA Bearings Course ($615).

Cancellation requests must be received in writing no later than April 27, 2017, to receive refund less $100 handling fee. No refunds issued after that date. Mail or fax this form to: STLE, 840 Busse Highway, Park Ridge, IL (USA) 60068. Fax: (847) 825-1456. Questions? Call (847) 825-5536.

Annual Meeting Registration Rates

Members/Speakers/Presenters: $655 – Non-members: $950

Life Members: $145 – Student Members: $35

After April 27 add $100

STLE Education Courses: Discounted rate with full meeting registration. $315 per course, except for the ABMA Bearings Course ($615). Box lunch included.

Sunday Education Courses, May 21, 2017 (8 am – 5 pm)

Please ✔ one course only!

- ❑ ABMA: Bearings and their Lubrication
- ❑ Advanced Lubrication 301: Advanced Additives
- ❑ Biofuels and Biolubricants
- ❑ Gears 101: Fundamentals of Gears
- ❑ Hydraulics 201: Hydraulic Fluids and System Overview
- ❑ Metalworking Fluids 115: Metal Removal Fluids
- ❑ Synthetic Lubricants 203: Non-Petroleum Fluids and Their Uses
- ❑ Half-day Nanotribology Session (1:30 – 5 pm). **Free but you must register in advance.**

Wednesday Education Courses, May 24, 2017 (8 am – 5 pm)

Please ✔ one course only!

- ❑ Advanced Lubrication 302: Advanced Lubrication Regimes
- ❑ Automotive Lubrication 201: Diesel
- ❑ Basic Lubrication 103: Basic Lubrication Overview
- ❑ Metalworking Fluids 250: Understanding and Controlling Metal Removal Fluid Failure
- ❑ Synthetic Lubricants 204: Basestock Selection and Applications

Social Functions

Please ✔ all that apply

- ❑ Sunday, May 21 golf outing: $80 *(golf, cart & box lunch included).*
  No. of players: _____
- ❑ Sunday, May 21 golf club rental: $35
  No. of sets: _____
  ❑ Left Hand ❑ Right Hand
- ❑ Monday, May 22 – Networking Reception (free). Qty: _____
- ❑ Tuesday, May 23 – Presidents Luncheon *(one complimentary ticket included).*
- ❑ Tuesday, May 23 – Additional Presidents Luncheon guest ticket ($50)

Ala Carte Offerings

- ❑ STLE course & box lunch only. Annual Meeting registration not required or included. **Members:** $505 per course. **Non-members:** $720 per course.
- ❑ ABMA Bearings Course $615 with or without separate meeting registration. Box lunch included.

Single-day Registration

- ❑ **Members:** $275. **Non-members:** $340
- ❑ Monday 5/22 admission (Technical Sessions & Trade Show Only)
- ❑ Tuesday 5/23 admission (Technical Sessions & Trade Show Only)
- ❑ Wednesday 5/24 admission (Technical Sessions & Trade Show Only)
- ❑ Thursday 5/25 admission (Technical Sessions Only)

Payment Information

❑ Payment Enclosed ❑ Payment Type: _____

Credit Card #: _____ Exp. Date: _____

Name on Card: _____

Payment Amount: $ _____.___ Signature: _____

Education Courses

The 2017 STLE Annual Meeting & Exhibition features 12 industry-specific education courses offered on two days of the conference: Sunday, May 21, and Wednesday, May 24. The schedule is designed to give attendees more flexibility when planning their conference attendance. Note: All courses are full day (start at 8 am and end at 5 pm).

STLE education courses are $315 with a full meeting registration (except for ABMA Bearings Course which is $615), $505 for STLE members and $720 for non-members without a meeting registration required or included. Box lunch included with course registration.

If you have questions regarding these courses, please contact Tom Heidrich, education & membership manager at (847) 825-5536, theidrich@stle.org.

***Please note that course titles and content are subject to change. Visit www.stle.org and see the Program Guide distributed onsite in Atlanta for the most up-to-date information and list of instructors.**

Sunday, May 21

ABMA: Bearings and their Lubrication (Presented in cooperation with ABMA)

This course includes a basic overview of bearings, their selection, precision and mounting considerations and lubrication-related influences, including a hands-on failure analysis session.

Advanced Lubrication 301: Advanced Additives

Advanced Lubrication 301 covers the molecular structures and chemistries of lubricant additive types. Additives examined will include antioxidants, rust inhibitors, detergents, dispersants, antiwear additives, extreme pressure additives, friction modifiers and rheology and viscosity modifiers.

Biofuels and Biolubricants

Biofuels and Biolubricants is an overview of current progress in the development and use of biofuels and biolubricants. The course elements will include an introduction to energy and alternative fuels; basic chemistry of biofuels and biolubes; general performance requirements; overview of market progress; niche markets; and governmental and regulatory drivers. Products currently in various stages of commercialization will also be discussed, including information on European, U.S. and OEM views. The course will primarily focus on biolubricants but will include a general overview of alternative transportation fuels. Biofuel feedstocks, production and quality issues will be covered.

Gears 101: Fundamentals of Gears

Gears 101 is designed to provide a general understanding of industrial gearing. This course was prepared as a guide for the user to establish a base knowledge of gears, supporting components, lubricants, condition monitoring, wear modes and failure analysis methodology.

Hydraulics 201: Hydraulic Fluids and System Overview

Hydraulics 201 provides an overview of the basic mechanical components used in hydraulic fluid power transmission. The composition and performance of hydraulic fluids will be discussed. The course will also feature sections on maintenance and troubleshooting as they pertain to hydraulic systems and in-service fluid analysis.

Metalworking Fluids 115: Metal Removal Fluids

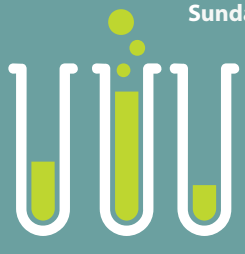
Metalworking Fluids 115 covers the key concepts needed to better understand how metalworking fluids are prepared, used and maintained. By the end of the course, participants will be informed about the reasons for using metal removal fluids and their functions. The chemistry of metal removal fluids, insight into the need to control microbial contamination and importance of adopting a health and safety program in a facility that machines metal are covered. Key topics include measures needed to understand and control metal removal fluid failure.

Synthetic Lubricants 203: Non-Petroleum Fluids and Their Uses

Synthetic Lubricants 203 is designed for formulators and users of lubricating materials. This course provides an overview of non-petroleum-based lubricants, their comparison to each other and to petroleum oil. Each section covers the chemistry, strength and weakness of each material and basic application.

Nanotribology Special Session

Sunday, May 21 • 1:30 – 5 pm



Although not part of the official education course curriculum, STLE is pleased to offer this free half-day special session to 2017 Annual Meeting attendees. STLE soon will release information on the content and instructors for this event. No additional fee, but please pre-register in advance at www.stle.org. Attendance is limited!

Greg Croce – Chair
Chevron Products Co.

Ramoun Mourhatch – Vice Chair
Chevron Oronite Co., LLC

Thomas Schiff – Past Chair
ExxonMobil Lubricants & Specialties

Dr. Edward Becker
Friction & Wear Solutions, LLC

Dr. Neil Canter
Chemical Solutions

Charles Coe
Grease Technology Solutions, LLC

Paul Hetherington
Petro-Canada Lubricants Inc.
(A Suncor Energy Business)

Brian Hovik
Chemetall

Dr. Frederick Passman
BCA, Inc.

520 participants attended the 12 education courses presented at STLE's 2016 Annual Meeting.

Wednesday, May 24

Advanced Lubrication 302: Advanced Lubrication Regimes

Advanced Lubrication 302 goes more in-depth on lubrication regimes, wear and wear mechanisms, as well as lubricant failure analysis. This course includes a series of lubricant failure analysis case studies on automotive engines, gears and bearings.

Automotive Lubrication 201: Diesel

Automotive Lubrication 201 provides a comprehensive overview of the various aspects of a typical diesel engine tribological system including modern fuels and lubricants. Lubrication and surface engineering principles will be applied to provide a unified approach to practical diesel powertrain systems.

Basic Lubrication 103: Basic Lubrication Overview

Basic Lubrication 103 is designed primarily for the person entering the lubrication field who needs a broad introduction to lubricants, lubricant-building blocks, and lubricating materials. This course is also for persons not directly involved, but who need a broad overview of lubricants and basic lubricating components. Basic Lubrication 103 does not require a formal scientific degree or background, although many technical terms and concepts are covered. Experienced people attend the course to be kept up-to-date on the latest developments, especially in those areas not directly related to their job function or area of expertise. Thus, Basic Lubrication 103 is usually attended by a broad cross section of people such as technical service, sales, marketing, manufacturing, maintenance, and management, who in some way are involved in the industry. Basic Lubrication 103 will focus on the fundamentals of lubrication associated with fluid film lubrication and grease as it applies to basic lubricated components such as gears and bearings. Also, the course will review some basics around the basestocks, synthetic lubricants and lab testing.

Metalworking Fluids 250: Understanding and Controlling Metal Removal Fluid Failure

Once a metalworking fluid has been qualified for use in an application, its performance depends on successful fluid management. In turn, successful fluids management depends on a fundamental understanding of the factors that work against fluid life and fluid performance, as well as cost-effective strategies for preventing these factors from causing metalworking fluid failure. Metalworking Fluids 250 is designed to meet both of these needs. It covers primary failure mechanisms, including the effect of contaminant particle size, water quality, microbes and oil contamination. Also presented are recommendations on how best to prevent each of these factors from destroying metalworking fluid performance and shortening metalworking fluid functional life.

Synthetic Lubricants 204: Basestock Selection and Applications

Synthetic Lubricants 204 provides an introduction to synthetic lubricant basestocks and applications. It compares the use of these synthetic lubricants to petroleum-based products and compares between types of synthetic lubricants. Synthetic Lubricants 204 is a continuation from the Synthetic Lubricants 203 (Non-Petroleum Fluids and Their Uses) course, however attendance of the Synthetic Lubricants 203 course is not a prerequisite.

STLE Certification Exams – Thursday, May 25

All four STLE technical certification exams: Certified Lubrication Specialist™, Oil Monitoring Analyst I and II™ and Certified Metalworking Fluids Specialist™ will be conducted concurrently Thursday, May 25, from 9 am to noon at the Hyatt Regency Atlanta. If you are interested in taking an exam during STLE's 2017 Annual Meeting & Exhibition, please contact Alicia Skulemowski at (847) 825-5536, certification@stle.org.

EXAM FEES

- **First exam: $395 (STLE member) • $525 (Non-member)**
- **Retake exam: $198 (STLE member) • $263 (Non-member)**

stle ATLANTA Networking & Special Events

Early Careerist Networking Event

Sunday, May 21

Students and young tribologists from around the world gather for an event defined by its networking value, camaraderie and good times. If you're from the next generation of STLE members, come join us for an evening of friendship and relationship building. The 2017 event is still being planned, and information will be released as soon as details are available. For more information, contact Tom Heidrich at (847) 825-5536, **theidrich@stle.org**.

Tribology STEM Camp

Monday, May 22

During STLE's 2017 Annual Meeting, the society is hosting area high school students for its 5th Annual Tribology STEM Camp. Students will have the opportunity to see demonstrations and participate in hands-on experiments, led by engineers and scientists, to learn about areas of research within the fields of tribology and lubrication engineering. The goal of the camp is to expose high school students interested in STEM (science, technology, engineering and mathematics) to careers in tribology and lubrication engineering. If you would like to learn more or to participate, contact Karl Phipps at (847) 825-5536, **kphipps@stle.org**.

Networking Reception

Monday, May 22

This is the annual meeting's central networking event and a way for you to reconnect with old friends while making new ones. Since people come to STLE's Annual Meeting & Exhibition from around the world, this truly is an international event. Relax, socialize and add to your list of professional contacts through this outstanding networking event.

Speakers Breakfast – Sunday-Thursday

May 21-25

Lead authors and course presenters are invited to meet with Session and Paper Solicitation Chairs for a continental breakfast at 7 am on the days of their presentations. This is a great time to review the session schedule and note any last-minute changes. Speakers should plan on attending.

Presidents Luncheon

Tuesday, May 23

The annual meeting's major business function draws virtually all attendees for a two-hour event honoring STLE's incoming and outgoing presidents, award winners and top volunteers. Come honor 2016-2017 President Ali Erdemir with Argonne National Laboratory and 2017-2018 President Mike Anderson with Falex Corp. A ticket for the Presidents Luncheon is included in your meeting registration and free to STLE Corporate Member representatives (two tickets) and students. Guest tickets for the luncheon are $50 and can be purchased at the STLE Registration Desk.

STLE is seeking sponsorships for the 2017 Networking Reception, Presidents Luncheon, Early Careerist Networking Event and Speakers Breakfast.

For more information, contact national sales manager Tracy Nicholas VanEe at (630) 922-3459, tnicholas@stle.org.

Golf Tournament

Sunday, May 21

Heritage Golf Links
4445 Britt Road
Tucker, Georgia 30084
www.heritagegolflinks.com

Heritage Golf Links (HGL) is located just 20 minutes from downtown Atlanta. Originally opened in 1996 as "Heritage Golf Club," HGL was nominated that year as one of the "Best New Golf Courses in America" by Golf Digest magazine. Today, the golf club boasts one of the highest slope ratings in Georgia. HGL is designed around a 20-acre lake, with water in play on several holes. The course's rolling terrain and dramatic elevation changes provide stunning vistas, and golfers of every skill level will love playing this challenging yet fun layout.

HGL provides its guests unsurpassed golf practice facilities, including simulated target greens (replete with bunkers), all-grass tee boxes, well-conditioned golf balls, putting green, chipping and pitching green, and an array of PGA-certified teaching professionals.

The tournament starts at 12:30 p.m. The fee is $80 (includes golf, cart, and box lunch). Clubs can be rented for $35 (limited supply at course with one month advance notice). **Please note: No transportation provided!**

Register for the golf tournament at **www.stle.org** or use the enclosed meeting registration form (see page 29).

Student Poster Competition

STLE is sponsoring a Student Poster Competition at its 2017 Annual Meeting & Exhibition. Awards are presented to the candidates demonstrating outstanding research, writing and verbal skills. The poster must deal with an aspect of tribology research that can be translated into friction, wear and lubrication. Students from all areas of tribology research are encouraged to participate, including manufacturing, biology, tribotesting, high tech and nanotribology. Specific subjects include aerospace, ceramics, condition monitoring, engine and drivetrain, environmentally friendly fluids, fluid film bearings, gears, health and safety, hydraulics, metalworking, nonferrous metals, power generation, rolling elements, seals, solid lubricants, surface engineering, synthetic lubricants, wear and other relevant topics.

Submission criteria & information

- Abstract submission deadline: March 15, 2017 (via **www.stle.org**).
- As the lead author, the student should have performed the major portion of the work.
- The poster must present original work of the student competitor during the 2016-2017 period.
- Full-time graduate or undergraduate students registered during the 2016-2017 academic year.
- May submit only one poster as the lead author for consideration.
- Student's presence at the poster display is required during the scheduled time in Atlanta.
- Poster board size is 4 x 4 feet.

Award category (three winners in each category)

- **Platinum:** superior scientific and presentation quality
- **Gold:** good technical quality
- **Silver:** overall quality worth

Questions about the Student Poster Competition may be directed to Merle Hedland at (630) 428-2133, mhedland@stle.org.

stle ATLANTA 2017 Exhibition

STLE's annual trade show is where you can catch up on the lubricant industry's latest products, services and technologies. Many annual meeting attendees say they have saved thousands of dollars and solved complex lubricant-related problems by making a connection at STLE's trade show.

STLE has several sponsorship and advertising opportunities sure to raise your company's profile in Atlanta. For more information or to customize a plan that meets your needs and budget, contact national sales manager Tracy Nicholas VanEe at (630) 922-3459, **tnicholas@stle.org**.

Booths are 10 x 10 feet and are $2,375 for STLE Corporate Members and $2,775 for Non-Corporate Members.

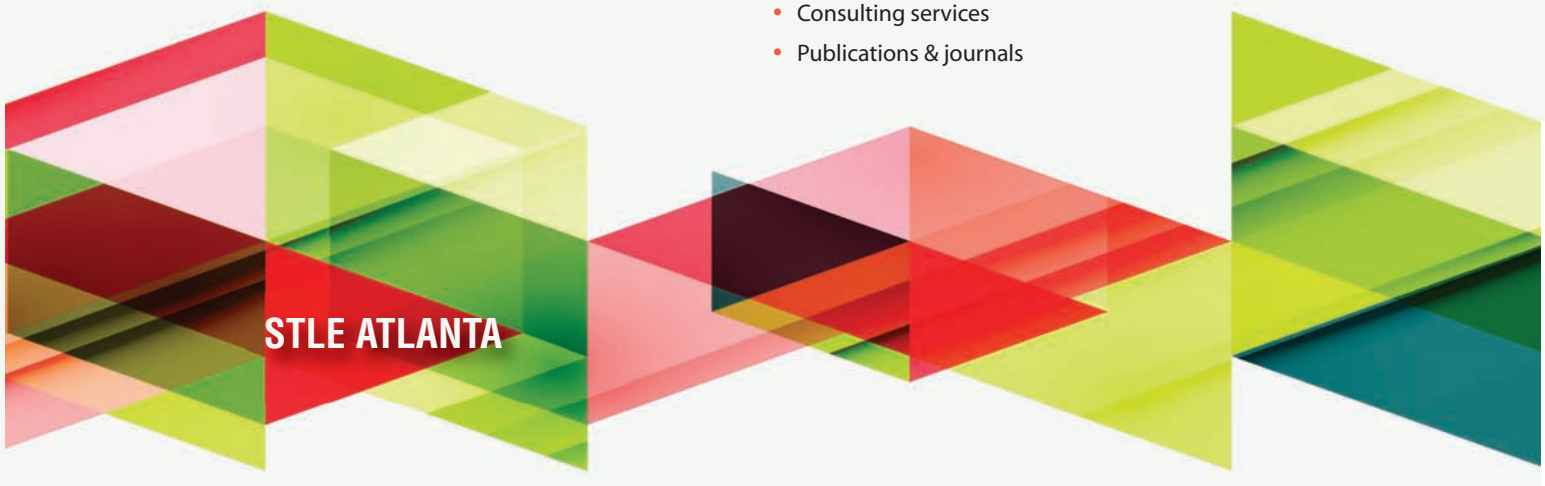
Exhibitor Appreciation Hour

Back by popular demand, two hours of dedicated exhibit time will occur at this year's show: **Monday, May 22** and **Tuesday, May 23** from 3-4 pm. Refreshments will be served in the trade show. Technical sessions, education courses, Commercial Marketing Forum presentations and all other annual meeting activities will cease at this time. Come support the meeting's exhibitors—and find solutions to your most pressing technical issues.

For more information or to reserve a booth, contact national sales manager Tracy Nicholas VanEe at (630) 922-3459, **tnicholas@stle.org**.

STLE's exhibition features companies from the following product categories:

- Lubricant additives
- Condition monitoring equipment
- Testing and analysis equipment, supplies and services
- Synthetic lubricants
- Metalworking fluids and additives
- Industrial fluids
- Lubrication management services
- Environmental services
- Consulting services
- Publications & journals



Sponsorships come in all shapes, sizes and prices and are designed to fit everyone's marketing budget. To reserve a sponsorship at the 2017 STLE Annual Meeting & Exhibition, contact national sales manager Tracy Nicholas VanEe at (630) 922-3459, tnicholas@stle.org.

Sponsorship Opportunities

If you are interested in gaining exposure and raising your company's profile at the annual meeting (thereby reaching some 1,600 members of the lubricants industry), **STLE offers several sponsorship opportunities**, including:

- Print advertising in TLT magazine and the popular Annual Meeting Program Guide distributed on site in Atlanta
- Badge Lanyards
- Education Course Materials
- Speakers Breakfast Series
- Registration Bags
- Bookmark for Annual Meeting Program Guide
- Networking Reception (Monday evening)
- Presidents Luncheon (Tuesday afternoon)
- Guest Room Keycards
- Annual Meeting Mobile App
- WiFi Service
- Recharging Lounge
- Welcome Gift
- Refreshment Breaks Plus Water Stations
- Exhibitor Appreciation Hour Raffle
- Student Activities Sponsorships

2017 Exhibitor Advisory Committee

STLE would like to thank the following individuals and their companies for being part of the Exhibitor Advisory Committee, which sets policies and practices for the trade show.

Carolyn Bazzini – The Dow Chemical Co.
Lori Fields – Cannon Instrument Co.
Robert Gordon – Tannas Co.
Kayli Goss – The Dow Chemical Co.
Bryan Huston – Acme-Hardesty
Stephanie Lee – Lonza
Yama Olumi – Evonik Oil Additives USA
Lauren Packard – Afton Chemical Corp.
Bridget Peabody – Chemtura Corp.
Raj Shah – Koehler Instrument Co., Inc.

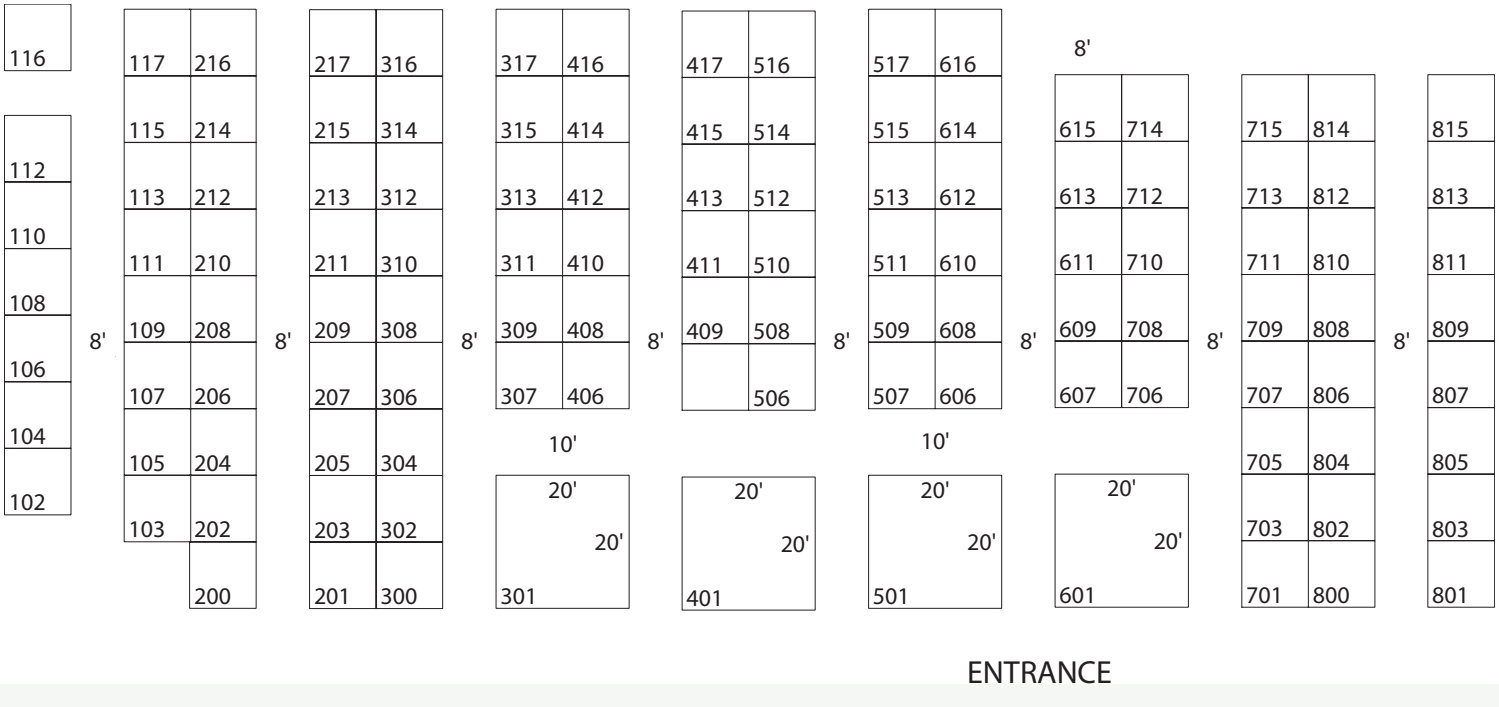
Exhibition Hours

Monday, May 22 • Noon – 5 pm
**Dedicated hour of trade show time from 3-4 pm. No other annual meeting activity during this time.*

Tuesday, May 23 • 9:30 am – Noon & 2 – 5:30 pm
**Trade show closes for two hours for the Presidents Luncheon & STLE Business Meeting from noon to 2 pm.*
Also, there will be a second dedicated hour of trade show time from 3-4 pm. No other annual meeting activity during this time.

Wednesday, May 24 • 9:30 am – Noon

Hyatt Regency Atlanta 2017 Floor Plan



2017 Annual Meeting Exhibitors

More than 130 organizations are expected to display their newest products and services at the 2017 STLE Exhibition. Following is the list of exhibitors as of Dec. 7, 2016. Visit **www.stle.org** and see the Program Guide distributed onsite in Atlanta for the most up-to-date list.

Acme-Hardesty
Adeka Corp.
Afton Chemical Corp.
ANGUS Chemical Co.
Anton Paar
Auburn University
Ayalytical Instruments, Inc.
Baron USA
Beckman Coulter
Bruker
BYK Additives & Instruments
Calumet Specialty Products Partners
Cannon Instrument Co.
C.C. Jensen, Inc.
Chemtura Corp.
Chevron Phillips Chemical Co.
Colonial Chemical
Eastman
Elè Corp.
Emery Oleochemicals
Ergon, Inc.
Evonik Oil Additives USA, Inc.
ExxonMobil Chemical Co.
FedChem, LLC
GEO Specialty Chemicals
Hangzhou Sungate Trading Co.
Houghton International
Industrial Quimica Lasem
INEOS Oligomers
Ingevity
KH Neochem Americas, Inc.
King Industries, Inc.
Koehler Instrument Co., Inc.
Lazar Scientific, Inc.
Metall-Chemie
Münzing
Nanjing Chemical Material Corp.
Nanovea
Napoleon Engineering Services
Nexeo Solutions
Norplex-Micarta
PCAS
PCC-Chemax, Inc.
PCS Instruments
PerkinElmer
PMC Crystal
Rtec-Instruments
SANAM Corp.
Sasol Performance Chemicals
Savant Labs/Institute of Materials
Sea-Land Chemical, Co.
Shanghai NACO Lubrication Co.
Shanghai Starry Chemical Co.
Soltex
SONGWON Industrial Group
Tannas Co.
Teknor Apex Co.
Temix Oleo
The Dow Chemical Co.
The Elco Corp.
The Lubrizol Corp.
Werner G. Smith
Wincom
Zygo

Society of Tribologists and Lubrication Engineers
840 Busse Highway, Park Ridge, Illinois (USA) 60068
847-825-5536 | info@stle.org | **www.stle.org**