

ADVANCE PROGRAM
REGISTER BY APRIL 18 AND SAVE \$100!



73rd STLE ANNUAL MEETING AND EXHIBITION

MAY 20-24, 2018 | MINNEAPOLIS CONVENTION CENTER
MINNEAPOLIS, MINNESOTA, USA

Message from the Chair

Technical education and professional development you can't get anywhere else!

Dear Industry Professional,

Some 1,600 of your peers in the lubricants industry will gather in May at the Minneapolis Convention Center in Minneapolis, Minnesota (USA), for a unique, five-day technical education event.

Whether you work in the field or the lab in industry, government or academia, STLE's 2018 Annual Meeting & Exhibition has technical programming tailored specifically for your job. The meeting is unique because no other organization offers such a complete look at the field of tribology.

STLE's Annual Meeting Program Committee has selected more than 500 technical presentations that will form the heart of the Minneapolis meeting. This brochure contains a preview of the technical program, enabling you to select the combination of research-oriented technical papers, application-based case studies, best-practice reports and panel discussions that is right for your career.

STLE's Annual Meeting also is the place to enhance your professional skills with 12 education courses taught by a faculty of top subject-matter experts. For experienced professionals, you can also verify your technical expertise, while furthering your career development by attaining one of STLE's four technical certifications: Certified Lubrication Specialist™, Certified Metalworking Fluids Specialist™ and Oil Monitoring Analyst I & II™.

This year's trade show includes more than 150 companies and organizations displaying the industry's newest products, services and technologies for lubrication professionals. The trade show is in the Minneapolis Convention Center, only a few steps from the technical sessions and education courses.

Business networking is an invaluable part of the STLE meeting experience. For many people, their STLE relationships are the No. 1

problem-solving resource they use on the job every day. These contacts are initiated and renewed each year at STLE's Annual Meeting & Exhibition.

Program details, housing information and other pertinent information about the meeting are all included in the following pages. If you require further information or assistance, please contact STLE headquarters or visit the STLE website at www.stle.org for program updates.

I'll look forward to seeing you in Minneapolis.

Sincerely,

Michel

**Dr. Michel Fillon, Chair
2018 Annual Meeting
Program Committee**



PHOTO BY DAN ANDERSON © COURTESY OF MEET MINNEAPOLIS



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General Information & Policies

The 2018 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 150-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 (ticket required).
- 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 22. These photos will be used to promote the May 19-23, 2019, STLE Annual Meeting & Exhibition in Nashville, Tennessee (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) and Annual Meeting Mobile App in early April 2018 prior to the annual meeting.

Annual Meeting Mobile App

Starting in April 2018, 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. (Available for Apple or Android products).



Registration Information

Meeting registration entitles you to all the technical sessions, trade show admission, Commercial Marketing Forum and all social events, including the Monday evening Networking Reception and Tuesday afternoon Presidents Luncheon (ticket required). Education courses are \$325 with full registration except for the NLGI Grease course (\$615). Please see the registration form on page 10.

2018 STLE Annual Meeting Registration Rates

Individual		Single-Day	
	Early Bird by April 18 (Save \$100!)	After April 18	Monday-Thursday
STLE members	\$685	\$785	\$300
Speakers	\$685	\$785	
Presenters	\$685	\$785	
Non-members	\$990	\$1,090	\$400
Life members	\$155	\$155	
Student members	\$40	\$40	

Onsite Registration

Register on site at the Minneapolis Convention Center, beginning at 3 p.m. on Saturday, May 19, 2018. All annual meeting events are at the Minneapolis Convention Center except for the Monday evening Networking Reception at the Hilton Minneapolis. The STLE registration desk is open daily thereafter through Thursday, May 24. 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 20 – 6:30 am – 6 pm
- Monday, May 21 – 6:30 am – 6 pm
- Tuesday, May 22 – 6:30 am – 6 pm
- Wednesday, May 23 – 6:30 am – 6 pm
- Thursday, May 24 – 6:30 am – Noon

Cancellations

Requests must be received in writing at STLE's headquarters no later than April 18, 2018, to receive refund less \$100 handling charge. No refunds will be issued after April 18.

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.

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 10) 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'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.**



2018 STLE Annual Meeting Program Committee

Dr. Michel Fillon – Chair

Institut Pprime

Dr. Ryan Evans – Vice Chair

The Timken Co.

Dr. Min Zou – Secretary

University of Arkansas

Dr. Gareth Fish

The Lubrizol Corp.

Dr. Jeffrey M. Guevremont

American Refining Group Inc.

Dr. Robert Jackson

Auburn University

Dr. Ashlie Martini

University of California, Merced



Get Social with Us!



Stay connected and keep up with the chatter using the hashtag **#STLE2018** when joining the conversation and stay up-to-date with meeting information and much more!

Twitter | [@STLE_Tribology](https://twitter.com/STLE_Tribology)

Facebook | Facebook.com/STLE



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.

Future Industry Meeting Dates

2018 STLE Tribology Frontiers Conference

The Drake Hotel
Chicago

October 28-31, 2018

Chicago, Illinois

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

STLE 76th Annual Meeting & Exhibition

Hyatt New Orleans

May 16-20, 2021

New Orleans, Louisiana

STLE 77th Annual Meeting & Exhibition

Walt Disney World Swan
& Dolphin

May 15-19, 2022

Orlando, Florida

BY THE NUMBERS

What You Need To Know About The STLE Annual Meeting & Exhibition

80% of surveyed attendees rate the technical presentations as GOOD or EXCELLENT quality.



50+

COUNTRIES REPRESENTED

500

Education Course Participants

60+

STUDENT POSTERS

200+

NEW ATTENDEES

1,600 INDUSTRY PROFESSIONALS

100+ EXHIBITORS

TOP 5

LUBRICANT-RELATED MARKETS ATTENDING

- Oil Analysis
- Metalworking Fluids
- Automotive
- Bearings
- Energy



ATTENDEE PROFILE

5%

Academia

5%

Students

6%

Government



18%

Other

66%

Industry



NOTABLE ATTRACTIONS*

Minneapolis
Sculpture Garden

Spoonbridge and Cherry

Weisman Art Museum

Mill City Museum

U.S. Bank Stadium
(Home of Super Bowl LII,
February 4, 2018)

Paisley Park Studios

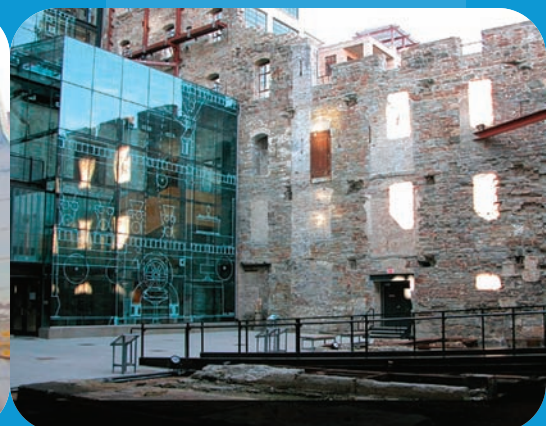
Walker Art Center

Nicollet Mall

Welcome to Minneapolis

Minneapolis is the largest city in the state of Minnesota that forms the “Twin Cities” with the neighboring state capital of St. Paul. Bisected by the Mississippi River, it’s known for its beautiful parks and lakes. Minneapolis is home to several Fortune 500 companies and many cultural landmarks such as the Walker Art Center, a contemporary art museum, and the adjacent Minneapolis Sculpture Garden, famed for Claes Oldenburg’s Spoonbridge and Cherry sculpture. The Minneapolis Skyway System, an interconnected climate-controlled system of footbridges throughout downtown, makes the restaurants, entertainment spots, shops, and sports centers all the more accessible.

Known as “The City of Lakes,” Minneapolis has 22 lakes located within city limits and many more in the surrounding area. In town, hordes of locals and tourists in-line skate or stroll around Lake Calhoun. Just outside of town, Fort Snelling State Park offers outdoor recreational activities from hiking to biking and golf to boating. Minneapolis offers lots for everyone to enjoy.



**For more information about Minneapolis (including 150 fun things to do!), visit www.minneapolis.org.*

Need a Visa? International attendees can request an invitation letter for the 2018 STLE Annual Meeting & Exhibition. For more information, contact Merle Hedland at (630) 428-2133, mhedland@stle.org.

Housing & Room Reservations

Housing for the 2018 STLE Annual Meeting & Exhibition is at:

Hilton Minneapolis (Headquarters Hotel) 1001 Marquette Avenue South Minneapolis, MN 55403

The Hilton Minneapolis is located in downtown Minneapolis, connected via skyway to the Minneapolis Convention Center and just blocks away from the city's shopping, dining and entertainment attractions. The Hilton is a short drive from the Minneapolis-St. Paul International Airport, with convenient access to the light-rail transit system.



© MEET MINNEAPOLIS

Hilton Minneapolis Hotel Amenities

- Complimentary in-room Wi-Fi for multiple devices
- Spacious guest rooms with refrigerator, laptop safe and 50-inch TV
- Complimentary 24-hour fitness center, indoor pool and sauna

STLE Annual Meeting Rates

- \$173 single occupancy (1 person)
- \$193 double occupancy (2 people)
- \$213 triple occupancy (3 people)
- \$233 quadruple occupancy (4 people)

Hyatt Regency Minneapolis 1300 Nicollet Mall Minneapolis, MN 55403

The Hyatt Regency Minneapolis is located on Nicollet Mall in the heart of the downtown business district. The hotel provides spectacular views of the city skyline, connected via skyway to the Minneapolis Convention Center. The Hyatt is a short drive from the Minneapolis-St. Paul International Airport, with convenient access to the light-rail transit system.



© MEET MINNEAPOLIS

Hyatt Regency Hotel Amenities

- Complimentary in-room Wi-Fi for multiple devices
- Refrigerator, 37-inch TV, laptop safe, coffee maker in each room
- Complimentary 24-hour fitness center and indoor pool

STLE Annual Meeting Rates

- \$183 single/double occupancy (1 or 2 people)
- \$208 triple occupancy (3 people)
- \$233 quadruple occupancy (4 people)

For meeting registration and room reservations, log on to www.stle.org. All annual meeting events are at the Minneapolis Convention Center except for the Monday evening Networking Reception at the Hilton Minneapolis. **April 18, 2018** is the cutoff date to receive discounted pricing at the Hilton and Hyatt. However, housing is assigned on a first-come, first-served basis, and STLE does not guarantee room availability on **April 18**. If you plan on attending the 2018 STLE Annual Meeting, you are urged to make your room reservations as soon as possible.

Society of Tribologists and Lubrication Engineers

STLE 73rd Annual Meeting and Exhibition Housing & Room Registration
May 20-24, 2018 • Minneapolis Convention Center • Minneapolis, MN

RESERVE ONLINE:

<https://aws.passkey.com/go/STLE18>

RESERVE BY PHONE:

(Individual reservations only)

9 am – 3 pm CST, Mon – Fri

1-888-947-2233 (Domestic)

1-612-767-8200 (International callers)

Please have your credit card number and your arrival and departure dates ready.

RESERVE BY FAX: 1-612-767-8201

RESERVE BY MAIL:

STLE Housing Dept.

250 Marquette Ave S., Suite 1300

Minneapolis, MN 55401

Please do not send repeat submittals for the same requests and do not fax or mail a form for reservations that you have already made online or by phone, or you risk making duplicate reservations.

You may email housing@minneapolis.org with any inquiries, changes or cancels.

- Only completed forms are accepted.
- Room types are assigned on a first-come, first-served basis.
- If your preferred hotel is not available, you will be assigned the next available property listed and/or the closest to the event.
- Allow 2 business days to receive your hotel acknowledgement. **Review all information for accuracy.**
- If you have not received your hotel acknowledgement by Wednesday, **April 18, 2018** please contact the STLE Housing Department at housing@minneapolis.org.
- The deadline to receive the group discounted rate on a space available basis is Wednesday, April 18.
- All reservation activity must continue to be made via STLE Housing (at above contact information) through Thursday, May 10, 2018.
- After Thursday, May 10, 2018, all reservations, changes and cancellations must be made directly with the hotel.

CONTACT INFORMATION: Please PRINT clearly

☐ If making multiple reservations, please check box if you are the contact for all reservations.

Name: _____

Company: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____

Email Address: _____

Acknowledgements may not be received if email filters are in place, so please add **groupcampaigns@pkghlrss.com** to your safe senders list.

ATTENDEE TYPE: ☐ General Attendee ☐ Exhibitor ☐ Government Rate

Note: Government attendees must present government I.D. at check-in to receive government rate.

HOTEL PREFERENCE: Please ✓ 1st choice

☐ **Hilton Minneapolis** (HQ) \$173/193/213/233 ☐ **Hyatt Regency** (MN) \$183/183/208/233

Rates are single/double/triple/quad occupancy.

NAME(S) OF ALL OCCUPANTS INCLUDING SELF:

Last Name	First Name	Arrival Date	Departure Date
Maximum room occupancy is four (4) per city code. Max occupancy in Hilton King room is three (3).			

ROOM TYPE REQUESTED: NOTE: Hotels are 100% non-smoking.

☐ 1 King Bed ☐ 2 Double Beds ☐ Wheelchair Accessible ☐ Other: _____

GUARANTEE/CANCELLATION POLICY: A major credit card number OR a check for one night's room and tax (add 13.4%) is required to secure each reservation.

Credit cards are for guarantee purposes only and are not charged to hold a reservation. Each room cancelled after Wednesday, April 18, will be charged or forfeit a cancel fee of \$50.00. Cancellations within 72 hours of the scheduled arrival date will be charged or forfeit one night's room and tax. A charge of one night's room and tax will be charged or forfeited on reservations that do not arrive and have not been cancelled (no-show). Early departures after check-in are subject to penalty fees set by the hotel.

Please identify your method of guarantee below:

CREDIT CARD: ☐ American Express ☐ MasterCard ☐ Visa ☐ Diner's Club ☐ Discover Card

Card No.: _____ Expiration Date: _____

Name of Card Holder: _____ Signature: _____

CHECK: Check Number: _____ Amount: _____

Checks must be received by Wednesday, April 18, 2018, and made payable to **Meet Minneapolis**. Reservations with a deposit guarantee, for which no check has been submitted, are subject to cancellation. Please base the amount of the check on 1st hotel preference.

Note: Institutional purchase orders are NOT accepted. Cancel refunds to those who guaranteed accommodations with a check deposit, will be mailed after the event.

DEADLINE:
Wednesday April 18, 2018

STLE 2018 Annual Meeting & Exhibition Individual Registration Form



Minneapolis Convention Center | Minneapolis, MN (USA) | May 20-24, 2018

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 \$325 with full meeting registration except for NLGI Grease Course (\$615).

Cancellation requests must be received in writing no later than April 18, 2018, 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: \$685 – Non-members: \$990

Life Members: \$155 – Student Members: \$40

After April 18 add \$100

STLE Education Courses: Discounted rate with full meeting registration. \$325 per course except for NLGI Grease Course (\$615). Box lunch included.

Sunday Education Courses, May 20, 2018 (8 am – 5 pm)

Please ✓ one course only!

- ☐ Advanced Lubrication 301: Advanced Additives
- ☐ Advanced Tribology 310: Nanotribology
- ☐ Automotive Lubrication 202: Gasoline
- ☐ Basic Lubrication 101: Fundamentals of Lubrication
- ☐ Hydraulics 201: Hydraulic Fluids and System Overview
- ☐ Metalworking Fluids 125: Health & Safety
- ☐ NLGI Grease 101

Wednesday Education Courses, May 23, 2018 (8 am – 5 pm)

Please ✓ one course only!

- ☐ Advanced Lubrication 302: Advanced Lubrication Regimes
- ☐ Basic Lubrication 102: Basic Applications
- ☐ Condition Monitoring 101
- ☐ Metalworking Fluids 105: Metal Forming Fluids
- ☐ Synthetic Lubricants 204: Basestock Selection and Applications

Social Functions (Please ✓ all that apply)

- ☐ Sunday, May 20 – U.S. Bank Stadium tour (\$49). *Subject to availability.*
- ☐ Sunday, May 20 – Paisley Park tour (\$85)
- ☐ Monday, May 21 – Networking Reception (free). Qty: _____
- ☐ Tuesday, May 22 – Presidents Luncheon (*one complimentary ticket included*).
- ☐ Tuesday, May 22 – Additional Presidents Luncheon guest ticket (\$50)

Ala Carte Offerings

- ☐ STLE course & box lunch only. Annual Meeting registration not required or included. **Members:** \$530 per course. **Non-members:** \$750 per course.
- ☐ NLGI Grease Course (\$615) with or without separate meeting registration. Box lunch included.

Single-Day Registration Admission

- ☐ **Members:** \$300. **Non-members:** \$400
- ☐ Monday, May 21 (Technical Sessions & Trade Show Only)
- ☐ Tuesday, May 22 (Technical Sessions & Trade Show Only)
- ☐ Wednesday, May 23 (Technical Sessions & Trade Show Only)
- ☐ Thursday, May 24 (Technical Sessions Only)

Payment Information

☐ Payment Enclosed ☐ Payment Type: _____

Credit Card #: _____

Exp. Date: _____

Name on Card: _____

Payment Amount: \$ _____ . _____

Signature: _____

2018 *Minneapolis* Daily Schedule-at-a-Glance

*As of Dec. 5, 2017

Saturday, May 19

3 – 6 pm
Onsite Registration

Sunday, May 20

6:30 am – 6 pm
Onsite Registration

7 – 7:45 am
Speakers Breakfast

8 am – 5 pm
Education Courses
(**registration required**)



6:30 – 8 pm
Student Networking Event*
(**Randle's Restaurant & Bar, Downtown Minneapolis**)

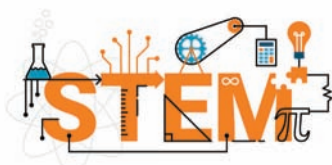
***Registration required**
Schedule is subject to change.
Please visit www.stle.org for the most current information. **All annual meeting events held at the Minneapolis Convention Center unless noted.**

Monday, May 21

6:30 am – 6 pm
Onsite Registration

7 – 7:45 am
Speakers Breakfast

8 – 10 am
Technical Sessions
Commercial Marketing Forum



8 am – 2 pm
Tribology STEM Camp

10 – 10:30 am
Refreshment Break

10:30 am – Noon
Opening General Session
Keynote Speaker:
Dr. Robert W. Ivester, U.S.
Department of Energy

Noon – 1:30 pm
Lunch (on your own)

Noon – 5 pm
Commercial Exhibits and
Student Posters

1:30 – 6 pm
Technical Sessions
Commercial Marketing Forum

**3 – 4 pm: Exhibitor
Appreciation Break**

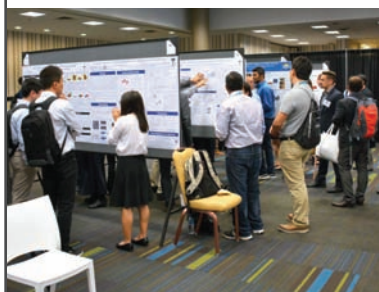
6:30 – 8 pm
Networking Reception
(**Hilton Minneapolis**)

Tuesday, May 22

6:30 am – 6 pm
Onsite Registration

7 – 7:45 am
Speakers Breakfast

8 – 10 am
Technical Sessions
Commercial Marketing Forum



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
Commercial Marketing Forum

2 – 5:30 pm
Commercial Exhibits and
Student Posters

**3 – 4 pm: Exhibitor
Appreciation Break**

Wednesday, May 23

6:30 am – 6 pm
Onsite Registration

7 – 7:45 am
Speakers Breakfast

8 am – 5 pm
Education Courses
(**registration required**)

8 am – Noon
Technical Sessions
Commercial Marketing Forum

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 24

6:30 am – Noon
Onsite Registration

7 – 7:45 am
Speakers Breakfast

8 – 10 am
Technical Sessions

8:30 am – 12:30 pm
STLE Certification Exams
(**registration required**)

10 – 10:30 am & 3 – 3:30 pm
Refreshment Break

1:30 – 6 pm
Technical Sessions



Choose from more than 500 presentations! 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. 5, 2017 – Subject to Change.

Monday, May 21, 2018

1B | Commercial Marketing Forum I

8 – 8:30 am | Sea-Land Chemical Company

8:30 – 9 am | Chevron Phillips Chemical Company

9 – 9:30 am | The Dow Chemical Company

9:30 – 10 am | Ingevity

10 – 10:30 am – Break

1C | Fluid Film Bearings & Surface Engineering Joint Session I

8 – 8:30 am | Influence of ECM-Microtextured in Tribology of EHL Lubrication Test

Glenn Gyimah, Guangdong University of Technology, Guangzhou, Guangdong, China

8:30 – 9 am | Analysis of Bearing Seizure of a PTFE Central Groove Journal Bearing During Start-Up Period – An Experimental and Numerical Study

Bálint Pap, Maxence Guillemont, Patrice Gedin, Fanelie Drevon, Ludwig Biadalla Safran Transmission Systems, Colombes, France, Michel Fillon, Université de Poitiers – Institut Pprime, Levallois-Perret, France

9 – 9:30 am | Experimental Performance for Vibration Testing on Surface-Textured Journal Bearings

Chao Chen, Xiaojing Wang, Zhaolun Li, Yifan Shen, Shanghai University, Shanghai, China

9:30 – 10 am | Hydrodynamic Tilting Pad Thrust Bearing Embedded with Cooling Circuitry: An Experimental Investigation

Farooq Najar, G. Harmain, Mohammad Zehabuddin, University of Kashmir, Srinagar, J&K, India

10 – 10:30 am – Break

1E | Lubrication Fundamentals I

8:30 – 9 am | Thickening Mechanisms of Polyisobutylene in Polyalphaolefin

Michelle Len, Uma Shantini Ramasamy, Ashlie Martini, University of California, Merced, Merced, CA, Seth Lichter, Northwestern University, Evanston, IL

9 – 9:30 am | Polymer VI Selection and Mixtures for Low Temperature Lubricants

Erik Willett, Functional Products Inc., Macedonia, OH

9:30 – 10 am | Temporary Shear Thinning and Hydrodynamic Friction of VM-Containing Engine Oils

Hugh Spikes, Nigel Marx, Imperial College London, London, United Kingdom, Beatriz Dominguez Jimeno, Francisco Barceló, Repsol Technology Centre, Madrid, Spain

10 – 10:30 am – Break

1F | Wear I

8 – 8:30 am | Efficacy of Lead Napthenate for Wear Protection in Boundary Lubrication Regime

Jason Galary, Nye Lubricants, Inc., Fairhaven, MA

8:30 – 9 am | Tribological Performance of Austempered and Tempered Ductile Iron

Bingxu Wang, Gary Barber, Oakland University, Rochester, MI, Xichen Sun, Fiat Chrysler Automobiles, Auburn Hills, MI

9 – 9:30 am | Influence of Film Structure on Gear Scuffing Resistance

Xinggao Fang, Mark Devlin, Philippe Ezanno, Afton Chemical Corporation, Richmond, VA

9:30 – 10 am | Wear From Oil-Dilution by Biodiesels: A Tribometer Study on Effects of Biodiesel Methyl-Ester Components

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

10 – 10:30 am – Break

1G | Metalworking I

8 – 8:30 am | Mixed Film Lubrication of Strip Rolling Using O/W Emulsion With the Adhressed Lubricant on the Surfaces

Behnam Hajshirmohammadi, Louisiana State University, Baton Rouge, LA

8:30 – 9 am | The Responsible Approach to Selection, Use and Disposal of Metalworking Fluid in the Manufacturing Environment

John Burke, Houghton International, Kirtland, OH

9 – 9:30 am | Green Metalworking Fluids: Synthesis and Testing

Suvin P S, Indian Institute of Science, Bangalore, Karnataka, India

9:30 – 10 am | Technological Breakthrough in Metalworking Fluids Based on Biopolymer

Mickael Ponsardin, Total Lubricants, Nanterre Cedex, France

10 – 10:30 am – Break

1J | Power Generation I

8 – 8:30 am | Lessons Learned on a 35-Year-Old Phosphate Ester, Electro-Hydraulic Control (EHC) System Experiencing Micro-Dieseling

Brian Thorp, Seminole Electric, Palatka, FL

8:30 – 9 am | Hydrolysis of Phosphate Esters in Acid Catalyzed Systems

Jatin Mehta, Cristian Soto, Fluitec International, Bayonne, NJ

9 – 9:30 am | The Problem of Phosphate Ester Fluid Darkening and Deposit Formation and Its Mitigation

Khalid Farooq, Pall Corporation, Port Washington, NY

9:30 – 10 am | Use and Maintenance of Arylphosphate Ester Electro-Hydraulic Control Fluids

Neal Milne, LANXESS Solutions UK Ltd., Manchester, United Kingdom

10 – 10:30 am – Break

1K | Seals I

Seal Technical Reviews

8 – 9 am | Lubrication Mechanisms in Mechanical Face Seals

9 – 10 am | Face Seal Materials

10 – 10:30 am – Break

10:30 – 11:30 am | Lip Seals

11:30 am – 12:30 pm | CFD Seals

1L | Tribochemistry I

Tribochemical Analysis

8 – 8:30 am | Probing Sliding Interfaces With In Situ Raman Spectroscopy

Praveena Manimunda, Syed Asif, Bruker Nano Surfaces, Eden Prairie, MN, Seong Kim, Pennsylvania State University, State College, PA, Vikram Jayaram, Indian Institute of Science, Bangalore, Karnataka, India, Richard Chromik, McGill University, Montreal, Quebec, Canada

8:30 – 9 am | In Contact High-Speed High Sensitivity Temperature Measurements Using Raman Microspectrometry

Audrey Molza, Theonord Paniague, Mathieu Adoue, Yves Bercion, Jean-Louis Mansot, Université des Antilles, Pointe à Pitre, Guadeloupe

9 – 9:30 am | Effect of Surface Reactivity on Tribo-Polymerization of Alpha-Pinene Molecules

Arash Khajeh, Jejoon Yeon, Ashlie Martini, University of California, Merced, Merced, CA, Xin He, Seong Kim, Pennsylvania State University, University Park, PA

9:30 – 10 am | Analyzing Initial Tribochemical Reactions at the Asperity Scale

Andrew Konicek, Fang Cao, Gary Hunter, Martin Webster, Peter Jacobs, ExxonMobil Research & Engineering, Annandale, NJ

10 – 10:30 am – Break

1M | Condition Monitoring I

8 – 8:30 am | Ultrasound Assisted Lubrication: 3 Ways to Improve Bearing Lubrication Practices

Adrian Messer, UE Systems, Inc., Anderson, SC

8:30 – 9 am | Rapid Determination of Key Lubricant Additive Changes Via DART – TOF Mass Spectrometry

Paul Harvath, General Motors, Pontiac, MI, Robert Cody, JEOL Inc., Peabody, MA

9 – 9:30 am | Lubrication Monitoring by Differential Scanning Calorimetry (DSC) Techniques to Determine the Lubricant Remaining Useful Life

Keith Schomburg, PerkinElmer, Shelton, CT

9:30 – 10 am | Assessment of Fluid Condition and Extent of Fluid Degradation of Water/Glycol Hydraulic Fluids Employed in Heavy Duty Truck Retarder Systems

John Duchowski, Irmhild Klaes, Sebastian Regin, HYDAC FluidCareCenter GmbH, Sulzbach, Saar, Germany

10 – 10:30 am – Break

1N | Engine & Drivetrain I

8 – 8:30 am | Investigation of Piston Ring Friction in a Component Test at Realistic Engine Speeds

Markus Söderfjäll, Roland Larsson, Andreas Almqvist, Luleå University of Technology, Luleå, Sweden, Hubert Herbst, Scania CV, Södertälje, Sweden

8:30 – 9 am | The DD13 Scuffing Test – Tribological and Chemical Analysis of Ring Pack Lubricants

Peter Lee, Jose Starling, Southwest Research Institute, San Antonio, TX

9 – 9:30 am | Comprehensive Piston Ring Coating Development Program For Friction and Wear Reductions – Part 1

Gregory Hansen, Peter Lee, Southwest Research Institute, San Antonio, TX

9:30 – 10 am | Comprehensive Piston Ring Coating Development Program For Friction and Wear Reductions – Part 2

Peter Lee, Gregory Hansen, Southwest Research Institute, San Antonio, TX

10 – 10:30 am – Break

1O | Rolling Element Bearings I

8 – 8:30 am | Failure Stress Modification in Subsurface Fatigue Life Models for Rolling Bearings

Pradeep Gupta, PKG Inc., Clifton Park, NY

8:30 – 9 am | Experimental & Analytical Investigation of Rolling Contact Fatigue of Refurbished Bearings

Zamzam Golmohammadi, Farshid Sadeghi, Purdue University, West Lafayette, IN

9 – 9:30 am | Non-Destructive Research on Fatigue Failures in Rolling Element Bearings Using Magnetic Fields

John Barton, Peter Lee, Southwest Research Institute, San Antonio, TX

9:30 – 10 am | Propagation of Surface Initiated Rolling Contact Fatigue Cracks in Bearing Steels

Amir Kadiric, Pawel Rycerz, Imperial College London, London, United Kingdom

10 – 10:30 am – Break

1P | Biotribology I

8 – 8:30 am | Friction-Induced Inflammation

Samantha Marshall, Samuel Hart, Juan Manuel Uruña, Kylie Van Meter, Kyle Schulze, Sean Niemi, Eric McGhee, Morgan Jones, Angela Pitenis, W. Gregory Sawyer, University of Florida, Gainesville, FL

8:30 – 9 am | Shear-Induced Cell Death in 3D Printing for Tissue Engineering

Sean Niemi, Samuel Hart, Samantha Marshall, Glyn Palmer, Padraic Levings, S. Ellison, Christopher O'Bryan, Thomas Angelini, W. Gregory Sawyer, University of Florida, Gainesville, FL

9 – 9:30 am | Shear Induced Fluorescence with Reporter Cells

Samuel Hart, Glyn Palmer, Juan Manuel Uruña, Angela Pitenis, Samantha Marshall, Padraic Levings, Thomas Angelini, W. Gregory Sawyer, University of Florida, Gainesville, FL

9:30 – 10 am | ATR-FTIR Spectroscopy and Friction Behavior of In-Vivo Skin

Marc Masen, Imperial College London, London, United Kingdom, Michel Klaassen, Erik de Vries, University of Twente, Enschede, Netherlands

10 – 10:30 am – Break

1Q | Synthetics & Hydraulics I

8 – 8:30 am | Improvement of Practical Demulsibility of Hydraulic Oil

Zhongguo Liu, Shaohui Li, Xinfeng Miao, Dalian Lubricating Oil Research & Development Institute, Dalian, Liaoning, China

8:30 – 9 am | Wax-Free Naphthenic Base Oils for High Performance Hydraulic Fluids in Low Temperature Applications

Thomas Norrby, Nynas AB, Nynashamn, Sweden

9 – 9:30 am | An Investigation of a Mass Flow Rate Method for Evaluating the Filterability of Hydraulic Fluids

Nathan Knotts, Chevron, Richmond, CA, Tahseen Tabassum, Stony Brook University, Stony Brook, NY, Mercy Cheekolu, Paul Michael, Milwaukee School of Engineering, Milwaukee, WI

9:30 – 10 am | Temporary and Permanent Viscosity Loss Correlated to Hydraulic System Performance

Paul Michael, Mercy Cheekolu, Pawan Panwar, Milwaukee School of Engineering, Milwaukee, WI, Mark Devlin, Afton Chemical Corporation, Richmond, VA, Duval Johnson, Ashlie Martini, University of California, Merced, Merced, CA

10 – 10:30 am – Break

2B | Commercial Marketing Forum II

1:30 – 2 pm | The Lubrizol Corporation

2 – 2:30 pm | King Industries, Inc.

2:30 – 3 pm | ExxonMobil Corporation

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | ANGUS Chemical Company

4:30 – 5 pm | Emory Oleochemicals Company

5 – 5:30 pm | LANXESS Chemical Corporation

2C | Fluid Film Bearings & Surface Engineering

Joint Session II

1:30 – 2 pm | A Mixed Lubrication Analysis of a Thrust Washer Bearing with Fractal Rough Surfaces

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

2 – 2:30 pm | Designing Journal Bearing Surface Texture Numerically for Friction Reduction

Thomas Gu, Qian Wang, Northwestern University, Evanston, IL, Arup Gangopadhyay, Zak Liu, Ford Motor Company, Dearborn, MI

2:30 – 3 pm | Performance of Textured 3-Lobe Slot-Entry Hybrid Journal Bearing System Operating with Electro-Rheological (ER) Lubricant

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

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Effect of the Variable Viscosity on the Hydrostatic Thrust Spherical Bearing Performance in the Presence of Centripetal Inertia and Surface Roughness Part 1 – Fitted Type of Bearings

Ahmad Elescondarany, Alexandria University, Alexandria, Egypt

4:30 – 5 pm | Numerical Simulation of Crosshead Bearing Lubrication for Marine Diesel Engine

Fuzhan Huang, Xiqun Lu, Bin Zhao, Hanzhan Xu, Harbin Engineering University, Harbin, Heilongjiang Province, China

5 – 5:30 pm | Elastohydrodynamic Analysis for Main Journal Bearings of Marine Low-Speed Diesel Engine

Chongpei Liu, Xiqun Lu, Qingbing Dong, Fuzhan Huang, Harbin Engineering University, Harbin, Heilongjiang Province, China

2E | Lubrication Fundamentals II

1:30 – 2 pm | An Analytical Review of the ASME Pressure-Viscosity Report from the Perspective of the Tait-Doolittle Equation

Thomas Zolper, University of Wisconsin-Platteville, Platteville, WI

2 – 2:30 pm | Improved Oxidation Stability and Solvency of Naphthenic/Paraffinic Blends – A Parameter Study

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

2:30 – 3 pm | On the Usage of Bench Tests for Fuel Economy Prediction

Brendan Miller, Shelby Skelton, Paul Sutor, Chevron Oronite Co. LLC, Richmond, CA

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Glycerol and DLC in Elastohydrodynamic Lubrication

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

4:30 – 5 pm | A Predictive Model to Correlate Atomistic Properties of Traction Fluids with Their Traction Coefficients

Jie Lu, Qian Wang, Northwestern University, Evanston, IL, Ning Ren, Frances Lockwood, Valvoline, Lexington, KY

5 – 5:30 pm | Spreading of Ultrathin Polymer Films on Nanotextured Substrates Using Molecular Dynamics

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

2F | Wear II

1:30 – 2 pm | Methods to Study the Life of An Asperity Subjected to Tribological Contact

Arnab Bhattacharjee, Nikolay Garabedian, David Burris, University of Delaware, Newark, DE

2 – 2:30 pm | Evolution of Fretting Wear on a Jointed Structure

Iyabo Lawal, Matthew Brake, Rice University, Houston, TX

2:30 – 3 pm | Friction and Wear Behavior of Metallic Glasses with Ionic Liquids as Lubricants

Jaeho Lee, Changdong Yeo, Texas Tech University, Lubbock, TX

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Study on the Erosion Performance and Prediction Model of the Sliding Sleeve Tee

Yanbao Guo, Deguo Wang, China University of Petroleum, Beijing, China

4:30 – 5 pm | Wear Map for Cu-Based Friction Materials with Different Contents of Fe

Haibin Zhou, Pingping Yao, Central South University, Changsha City, Hunan Province, China

2G | Metalworking II

1:30 – 2 pm | Fighting Foam and Long-Term Stability Issues: Clearing Up Long-Standing Prejudices About the Suitability of Different Emulsifier Chemistries

Michael Stapels, Kao Chemicals, Emmerich, Germany

2 – 2:30 pm | EO/PO Copolymers Profile as Performance Solution on Foam Control for Synthetic and Semisynthetic Metalworking Fluids

Eduardo Lima, Dow Brazil, São Paulo, Brazil

2:30 – 3 pm | Hard Metal Cutting Methodology

Anthony Jarvis, Afton Chemical Ltd., Manchester, United Kingdom

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Shifting Perspectives: Formulating for Industry Longevity

Nicole Webb, Soraya Kraszczyk, Bonnie Pyzowski, ANGUS Chemical Company, Buffalo Grove, IL

4:30 – 5 pm | Multimetal Corrosion Inhibition in Metalworking Fluid Applications: The What, Why and How

Monica Ford, Tevin Proctor, Ingevity, North Charleston, SC

5 – 5:30 pm | Utilizing ATP Analysis to Determine the Impact of Different Metalworking Fluid Formulations on Biofilm Development

Bari Kresloff, Quaker Chemical Corporation, Conshohocken, PA, Frederick Passman, Biodeterioration Control Associates, Inc., Princeton, NJ

5:30 – 6 pm | Evaluation of the Washability and Paintability of Defoamer Technologies for Aqueous Metalworking Fluids

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

6 – 6:30 pm | Metal Cleaning: How to Select Cleaning Solutions for MWF and Rust Preventives

Claude Hedoire, Solvay, Aubervilliers, France

2J | Power Generation II

1:30 – 2 pm | Effect of Formulation on Solvency Properties of Lubricating Oil

Cristian Soto, Jatin Mehta, Fluitec International, Bayonne, NJ

2 – 2:30 pm | Study of the Change of Membrane Patch Color During Oxidation Process of Turbine Oil

Tomohiko Kon, Tomomi Honda, University of Fukui, Fukui-shi, Fukui, Japan, Akira Sasaki, Maintek Consultant, Yokohama, Japan

2:30 – 3 pm | Oil and Water Shouldn't Mix: Restoration of Steam Turbine Oil Demulsibility

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

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Study on Oxidation Duration and Sludge of Turbine Oil by Dry-TOST Test

Daxin Sun, Zhongguo Liu, Peng Li, Chao Yang, Dalian Lubricant R&D Institute of Petrochina Lubricant Company, Dalian, China

4:30 – 5 pm | Early Detection of Cooling System Water Leaks in Gas Engines

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

2K | Seals II

1:30 – 2 pm | Mapping the Performance of Dynamic Elastomer Seals

Peter Lee, Southwest Research Institute, San Antonio, TX

2 – 2:30 pm | Comparison of Performance Test Results to CFD and Structural Models of Non-Contacting Finger Seals

Margaret Proctor, Maria Kuczmarski, James Johnston, Amy Stalker, NASA Glenn Research Center, Cleveland, OH

2:30 – 3 pm | Leakage Characteristic Prediction of Gas Turbine Through Experimental Correlation

Yong Hwan Kwon, Jin-woong Ha, Doosan Heavy Industries & Construction, Yongin, Republic of Korea

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | A New Approach How to Achieve Back Pumping on PTFE Lip Seals

Lothar Hoerl, Frank Bauer, Nino Dakov, Mario Stoll, University of Stuttgart, Stuttgart, Germany

4:30 – 5 pm | Multi-Scale Simulation of Sliding Friction Process of EPDM Rubber Seals

Jian Wu, Chuanbing Zhang, Youshan Wang, Benlong Su, Harbin Institute of Technology, Weihai, Shandong, China

5 – 5:30 pm | Seals Business Meeting

2L | Tribochemistry II

Scanning Probe Tribochemistry

1:30 – 2 pm | Nanoscale Adhesion of Sliding Silicon Contacts is Increased by Speed and Stress

Zachary Milne, Tevis Jacobs, Robert Carpick, University of Pennsylvania, Philadelphia, PA, Rodrigo Bernal, University of Texas at Dallas, Dallas, TX

2 – 2:30 pm | Quantifying Tribochemical Wear of Silicon AFM Tips Sliding on Aluminum Oxide

Erin Flater, Jared Barnes, Jesse Hitz Graff, Jayse Weaver, Luther College, Decorah, IA, Naveed Ansari, Aimee Poda, W. Robert Ashurst, Auburn University, Auburn, AL

2:30 – 3 pm | Scanning Probe Tribocorrosion of Aged 2507 Duplex Stainless Steel

J. Michael Shockley, Christopher So, Derek Horton, Kathryn Wahl, US Naval Research Laboratory, Washington, DC

3 – 4 pm – Exhibitor Appreciation Break

2M | Condition Monitoring II

1:30 – 2 pm | Model-Based Wind Turbine Bearing Fault Analysis

Ehsan Mollasalehi, David Wood, Qiao Sun, University of Calgary, Calgary, Alberta, Canada

2 – 2:30 pm | Grease Oxidation Analysis Using Pressure Differential Scanning Calorimetry (PDSC) Techniques to Determine Antioxidant Performance

Keith Schomburg, PerkinElmer, Magnolia, TX

2:30 – 3 pm | New Methods of Comparing Varnish Removal Using Chemical Flushing

Duval Johnson, Ashlie Martini, University of California, Merced, Merced, CA, Zhen Zhou, Elizabeth Montalvo, Enrique Dominguez, Chevron, Richmond, CA

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Dirty Dozen: 12 Things You Need to Know about Oil Contamination

Henry Neicamp, Polaris Laboratories, Indianapolis, IN

4:30 – 5 pm | Engines Sludge in Africa: Causes and Remedies

Joseph Fotue Sado, TOTAL Cameroon, Douala, Cameroon

5 – 5:30 pm | Application of Electrical Impedance Method to Condition Monitoring of Steel/Steel EHD Contacts

Taisuke Maruyama, NSK Ltd., Fujisawa, Kanagawa, Japan, Ken Nakano, Yokohama National University, Yokohama, Japan

2N | Engine & Drivetrain II

1:30 – 2 pm | Friction and Wear Performance of Engine Oils Formulated with Polyalkylene Glycol and Mineral Oil

Arup Gangopadhyay, Robert Zdrodowski, Zak Liu, Ford Motor Company, Novi, MI, John Cuthbert, The Dow Chemical Company, Midland, MI, Nicolas Obrecht, Nicolas Champagne, Total Marketing Services, Solaize, France

2 – 2:30 pm | PPD Considerations for SAE 0W-16 Formulations

Joan Souchik, Brian Hess, Justin Mills, Evonik Oil Additives, Horsham, PA

2:30 – 3 pm | High Viscosity Esters to Reduce Friction and Wear

Jason Lagona, Croda, New Castle, DE

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Effect of Calcium and Magnesium Type Detergents and Molybdenum Chemicals on Tribofilm Formation

Kenji Yamamoto, Yukiya Moriizumi, Ryo Hanamura, Adeka Corporation, Tokyo, Japan

4:30 – 5 pm | Tribological Performance of Ultra-Low Viscosity Composite Base Fluid with Bio-Derived Fluid

M. Cinta Lorenzo Martin, Oyelayo Ajayi, George Fenske, Argonne National Laboratory, Lemont, IL, Girma Biresaw, Rogers Harry-O'kuru, Grigor Bantchev, USDA-ARS-NCAUR, Peoria, IL

5 – 5:30 pm | Ionic Liquid-Containing Additives for Engine Oils

Lelia Cosimbescu, Abhijeet Bapat, Pacific Northwest National Laboratory, Richland, WA, Robert Erck, Nicholas Demas, Argonne National Laboratory, Argonne, IL, Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN

2O | Rolling Element Bearings II

1:30 – 2 pm | Formation of White Etching Cracks (WECs) Under Rolling Loading – Mechanical Drivers and Pre-Stages

Francisco Gutiérrez Guzmán, Georg Jacobs, Daniel Cornel, Adrian Mikitisin, RWTH Aachen University, Aachen, Nordrhein Westfalen, Germany

2 – 2:30 pm | Short-Term Heavy Loads – One Cause for Premature Bearing Failures and White Etching Cracks

Kenred Stadler, Maria Andreen, Marica Ersson, SKF GmbH, Schweinfurt, Germany

2:30 – 3 pm | Investigating Effects of Evolution of Residual Stresses on Rolling Contact Fatigue

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

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Friction Losses of Cylindrical Roller Bearings Due to Axially Oscillating Shafts

Andreas Meinel, Stephan Tremmel, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany

4:30 – 5 pm | Preliminary Experimental Investigations on Power Losses in Rolling Element Bearings

Dimitri Niel, Fabrice Ville, LaMCoS, Villeurbanne, France, Christophe Changenet, LabECAM, Lyon, France, Michel Octrue, Cetim, Senlis, France

2P | Biotribology II

1:30 – 2 pm | Molecular Lubrication Mechanisms of Hydrogels

Rosa Espinosa-Marzal, Tooba Shoaib, Joerg Heintz, Josue Lopez-Berganza, Raymundo Muro-Barrios, Simon Egner, University of Illinois at Urbana-Champaign, Urbana, IL

2 – 2:30 pm | Structure and Dynamics of Mucin Networks

Tristan Hormel, Tapomoy Bhattacharjee, Christopher O'Bryan, Angela Pitenis, Juan Manuel Uruña, W. Gregory Sawyer, Thomas Angelini, University of Florida, Gainesville, FL

2:30 – 3 pm | Design of a Novel Tribocorrosion Cell Culture System for Calibrated Generation of CoCrMo Wear Debris

Taylor Holcomb, Simona Radice, Robin Pourzal, Michel Laurent, Nadim Hallab, Markus Wimmer, Rush University Medical Center, Chicago, IL

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Boundary Lubrication and Antiphospholipid Syndrome (APS) in Natural Joints

Zenon Pawlak, Tribochemistry Consulting, Salt Lake City, UT, Mariusz Kaczmarek, Mieczyslaw Cieszkowski, Wieslaw Urbaniak, Kazimierz Wielki University, Bydgoszcz, Poland

4:30 – 5 pm | Interfacial Assembly Structures and Nanotribological Properties of Lubricating Molecules

Yuhong Liu, State Key Laboratory of Tribology, Beijing, China

5 – 5:30 pm | Viscoelasticity and Fatigue of 3D Kirigami Polymer-Based 3D Structures for Flexible Bioelectronics Using In Situ Flat Punch Compression

Mohammad Humood, Andreas Polycarpou, Texas A&M University, College Station, TX, Mengdi Han, University of Illinois at Urbana-Champaign, Urbana, IL, Joseph Lefebvre, Bruker Nano Surfaces, Eden Prairie, MN, John A. Rogers, Northwestern University, Evanston, IL

2Q | Synthetics & Hydraulics II

1:30 – 2 pm | A New Test Method to Evaluate Hydraulic Fluids for Vane Pumps

Emmanuel Georgiou, Dirk Drees, Michel De Bilde, Falex Tribology NV, Rotselaar, Belgium, Michael Anderson, Falex Corporation, Sugar Grove, IL

2 – 2:30 pm | Demonstrating System Efficiency of Construction Equipment

Justin Langston, Evonik Oil Additives, Horsham, PA, Frank-Olaf Maehling, Thorsten Bartels, Achmad Zen, Thomas Schimmel, Evonik Industries AG, Darmstadt, Germany

2:30 – 3 pm | Viscosity Index Is Not the Only Driver of Hydraulic Fluid Efficiency

Shubhamita Basu, The Lubrizol Corporation, Wickliffe, OH

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Impact of a High Particle Count Hydraulic Fluid on a High-Pressure Vane Pump

Nathan Knotts, Chevron Products Company, Richmond, CA

4:30 – 5 pm | Effect of the Hydraulic Fluid on the Failure of a Main Pump

Arturo Cardenas, GIGATEC, San Luis Potosi, SLP, Mexico

Tuesday, May 22, 2018

3A | Nanotribology I

Mechanisms of Friction Uncovered Through Nanoscale Inquiry

8 – 9 am | Mechanisms of Lubrication at the Nanometer Scale

Roland Bennewitz, INM Leibniz Institute for New Materials, Saarbrücken, Germany

9 – 9:30 am | Linking Macro-Scale and Atomic-Scale Friction

Nikolay Garabedian, David Burris, University of Delaware, Newark, DE

9:30 – 10 am | Mechanisms Underlying Lubrication by Polymers in Ionic Liquids

Rosa Espinosa-Marzal, Mengwei Han, University of Illinois at Urbana-Champaign, Urbana, IL

10 – 10:30 am – Break

10:30 – 11 am | Humidity Dependence of Friction Between Nanoasperities and Graphite

Zhijiang Ye, Miami University, Oxford, OH, Kathryn Hasz, Robert Carpick, University of Pennsylvania, Philadelphia, PA, Ashlie Martini, University of California, Merced, Merced, CA

3B | Commercial Marketing Forum III

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

8:30 – 9 am – Chevron Phillips Chemical Company

9 – 9:30 am – Institute of Materials

9:30 – 10 am – Sasol North America, Inc.

10 – 10:30 am – Break

10:30 – 11 am – Croda, Inc.

11 – 11:30 am – Kao Chemicals GmbH

11:30 am – Noon – Münzing

3C | Fluid Film Bearings I

8:30 – 9 am | Many Core Computing of Group-Inching Fortification Method for Air Bearing Design

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

9 – 9:30 am | Aspects Regarding the Integration of Contact Mechanics, Wear and Hydrodynamic Lubrication Models

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

9:30 – 10 am | Generalized Newtonian Viscosity Functions for Hydrodynamic Lubrication

Scott Bair, Georgia Institute of Technology, Atlanta, GA

10 – 10:30 am – Break

10:30 – 11 am | A Comparison of the Dynamic Properties of a Hydrodynamic Journal Bearing Predicted Using CFD With a Moving Boundary and the Perturbed Reynolds Equation

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

11 – 11:30 am | A CFD Study on the Influences in Hot Oil Carry-Over in Journal Bearing Grooves

Harrison Gates, Brian Weaver, Houston Wood, University of Virginia, Charlottesville, VA

11:30 am – Noon | Determination of Stiffness and Damping Coefficients for Journal Bearings using Various Methods

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

3D | Materials Tribology I

Solid Lubricants, Coatings, and 2D Materials

8 – 8:30 am | Atomically Thin Layers of 2D Materials Coupled With DLC to Minimize Friction in Steel Contacts

Kalyan Mutyala, Ali Erdemir, Anirudha Sumant, Argonne National Laboratory, Argonne, IL

8:30 – 9 am | Nano and Macro Exploration of Friction in Lattice-Layer Compounds

Steve Shaffer, Bruker, San Jose, CA, Giovanni Ramirez, Bruker Nano Surfaces, San Jose, CA, Joseph Lefebvre, Manimunda Praveena, Bruker-Hysitron, Eden Prairie, MN

9 – 9:30 am | MoS₂-Based Composite Solid Lubricants for Extreme Environments

Michael Dugger, Brendan Nation, Sandia National Laboratories, Albuquerque, NM

9:30 – 10 am | A Predictive Thermokinetic Model of Friction in MoS₂

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

10 – 10:30 am – Break

10:30 – 11 am | Excellent Anti-Wear Lubrication Under High Pressure Realized with Synthetic Oil-Soluble Ultrathin MoS₂ Sheets

Zhe Chen, Massachusetts Institute of Technology, Cambridge, MA, Yuhong Liu, Jianbin Luo, State Key Laboratory of Tribology, Beijing, China

11 – 11:30 am | Diamond-Like-Carbon Coating for Demanding Mechanical Seal Applications

Thiyagarajan Natarajan, Jiao Yang, Klaus Meck, John Crane, Manchester, United Kingdom

11:30 am – Noon | Tribological Characteristic Evaluation in a Vacuum of a Coating Film using 0.5 μm Tungsten Disulfide Powder

Ayaka Takahashi, Josaphat Sumantyo, Chiba University, Inage, Chiba, Japan, Keizo Hashimoto, Teikyo University, Utsunomiya, Japan

3E | Lubrication Fundamentals III

8:30 – 9 am | A Visco-Elastic Traction Model for MIL-PRF-23699 Turbine Engine Lubricant

Nelson Forster, Steven Kratz, Robert Homan, Wedeven Associates Inc., Edgmont, PA

9 – 9:30 am | Numerical Accuracy of Three-Dimensional Finite and Infinite Long Line Lubrication Problems

Tao He, Northwestern University, Evanston, IL, Dong Zhu, Harbin Engineering University, Harbin, China

9:30 – 10 am | Measurement of EHL Contact Temperature for Different Bulk and Coating Materials

Martin Ebner, Andreas Ziegler, Thomas Lohner, Karsten Stahl, FZG – Gear Research Centre, TUM – Technical University of Munich, Munich, Germany

10 – 10:30 am – Break

10:30 – 11 am | Prediction of Friction in EHL Point Contacts Operating Under Mixed Lubrication Conditions

Andreas Almqvist, Marcus Björling, Luleå University of Technology, Luleå, Sweden

11 – 11:30 am | Determination of Limiting Shear Stress of Lubricant Based on the Layered Wall Slippage Model and Experimental Results at High Speeds

Wenzhong Wang, Yaoguang Zhang, Ziqiang Zhao, Beijing Institute of Technology, Beijing, China

3F | Wear III

8 – 8:30 am | PEEK Transfer Film Development: Exploration of Potential Mechanisms Which Occur During Linear and Multi-Directional Sliding

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

8:30 – 9 am | Design of Novel Solid Lubricant Materials by Using MAX and MAB Phases

Surojit Gupta, University of North Dakota, Grand Forks, ND

9 – 9:30 am | Assessment of PDC-Rock Friction

John Bomidi, Konrad Izbinski, Baker Hughes, The Woodlands, TX, Aaron Dick, Caldera Services, Houston, TX

9:30 – 10 am | Tribological Damage Study of Inconel 617 in a Simulated High Temperature and Helium Environment

Arman Ahmadi, Farshid Sadeghi, Purdue University, West Lafayette, IN

10 – 10:30 am – Break

10:30 – 11 am | Method to Calculate Wear Volume of Cylinder Liners from Three-Dimensional Surface Profiles, Part I

Robert Erck, Nicholas Demas, George Fenske, Argonne National Laboratory, Argonne, IL

11 – 11:30 am | Method to Calculate Wear Volume of Cylinder Liners from Three-Dimensional Surface Profiles, Part II

Nicholas Demas, Robert Erck, George Fenske, Argonne National Laboratory, Argonne, IL

11:30 am – Noon | Wear Study of Quasicrystal Alloys

Kyungjun Lee, Hong Liang, Texas A&M University, College Station, TX

3G | Metalworking III

8 – 8:30 am | A Combinatorial Approach to Metalworking Fluid Formulation

Amelia Hadler, Britt Minch, John Hogan, Gabe Kirsch, Johnnie Thomlison, The Lubrizol Corporation, Wickliffe, OH

8:30 – 9 am | Systematical Approach to Build Lubricity Additive Package in Metal Cutting Fluid Formulations

Yixing Zhao, Shilpa Beesabathuni, Houghton International, Norristown, PA

9 – 9:30 am | Boundary Lubricant Additive Response Comparisons Using Twist Compression Tests (TCT)

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

9:30 – 10 am | Using 4-Ball Testing to Determine Lubricity and Wear

Emil Schnellbacher, Additives International – Lockhart Chemical, Allen Park, MI

10 – 10:30 am – Break

10:30 – 11 am | The Importance of Properly Diluting Coolants

Alan Cross, Houghton International, Inc., Valley Forge, PA

11 – 11:30 am | Coefficients of Friction Between Chip and Cutting Tool in Near-Dry Milling Processes

Lan Yan, Huaqiao University, Xiamen, Fujian, China

3H | Contact Mechanics I

8 – 8:30 am | Strain Hardening from Elastic-Perfectly Plastic to Perfectly Elastic Contact

Matthew Brake, Rice University, Houston, TX, Hamid Ghaednia, Michael Berryhill, Robert Jackson, Auburn University, Auburn, AL

8:30 – 9 am | Elasto-Plastic Contact of Heterogeneous Materials With the Consideration of Tangential Tractions

Qingbing Dong, Tongyang Li, Harbin Engineering University, Harbin, China

9 – 9:30 am | A Finite Element Study of an Elasto-Plastic Disk or Cylindrical Contact Against a Rigid Flat in Plane Stress with Bilinear Hardening

Robert Jackson, Aman Sharma, Auburn University, Auburn, AL

9:30 – 10 am | A Study on Elasto-Plastic Contact of Random One-Process and Two-Process Textures

Pawel Pawlus, Andrzej Dzierwa, Rzeszow University of Technology, Rzeszow, Poland, Wieslaw Zelasko, Group of Technical Schools, Lezajsk, Poland

10 – 10:30 am – Break

10:30 – 11 am | The Solution of Frictional Thermal Contact Problem of Magneto-Electro-Elastic Materials

Haibo Zhang, Wenzhong Wang, Shengguang Zhang, Ziqiang Zhao, Beijing Institute of Technology, Beijing, China

11 – 11:30 am | Electromechanical Failure of MoS₂ Nanosheets

Peng Huang, Dan Guo, State Key Laboratory of Tribology, Tsinghua University, Beijing, China

11:30 am – Noon | Dynamic Contact in Multiferroic Energy Conversion

Xin Zhang, Qian Wang, Northwestern University, Evanston, IL, Zhanjiang Wang, Huoming Shen, Southwest Jiaotong University, Chengdu, China

3I | Grease I

8 – 8:30 am | Effect of Testing Parameters on the Tackiness of Greases

Emmanuel Georgiou, Dirk Drees, Michel De Bilde, Falex Tribology NV, Rotselaar, Belgium, Michael Anderson, Falex Corporation, Sugar Grove, IL

8:30 – 9 am | Tilting at Wind Turbines: An Adventure in Lubrication

Joseph Kaperick, Afton Chemical Corporation, Richmond, VA

9 – 9:30 am | Phosphorous Based Ionic Liquids as Additives in Lithium Complex Greases

Kimaya Vyavhare, Pranesh Aswath, University of Texas at Arlington, Arlington, TX

9:30 – 10 am | A New Preformed Polyurea Thickener

Zhe Jia, John Cuthbert, Nathan Wilmot, Bruce Hook, Andrew Larson, Dow Chemical, Freeport, TX

10 – 10:30 am – Break

10:30 – 11 am | The Effect of Base Oils on Thickening and Physical Properties of Lubricating Greases

Timothy Langlais, Edward Casserly, Staci Springer, Ergon, Inc., Jackson, MS

11 – 11:30 am | A Microstructural Characterization of Grease Under Deformation by Dielectrostriction Measurement

David Pickens, Yiyan Peng, Qian Wang, Northwestern University, Evanston, IL

11:30 am – Noon | In Situ Probing of Stress-Induced Nanoparticle Dispersion and Friction Reduction in Lubricating Grease

Carlos Sanchez, Southwest Research Institute, San Antonio, TX, Hong Liang, Yunyun Chen, Texas A&M University, College Station, TX

3J | Power Generation III

8 – 8:30 am | New PAG Turbine Oil That Enable Easy Management and Exchange From Mineral Oil

Yuuhei Shirakura, Hiroki Sekiguchi, Idemitsu Kosan Co., Ltd., Ichihara-shi, Chiba, Japan, Nazmul Hossain, Dimas James, Idemitsu Lubricants America Corporation, Southfield, MI

8:30 – 9 am | Developments in Turbine Oil Formulation

Paul Sly, Chevron, Huffman, TX

9 – 9:30 am | High Temperature and Long Life Mineral Turbine Oil Having EP Characteristics

Hiroki Sekiguchi, Idemitsu Kosan Co., Ltd., Ichihara-shi, Chiba, Japan

9:30 – 10 am | Diesel Fuel Contaminated with Lighter Hydrocarbon Fuel

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

10 – 10:30 am – Break

10:30 – 11 am | The Impact of Lubricating Oil Formulations on Filter Element Charging Behavior

John Duchowski, Timo Lang, HYDAC FluidCareCenter GmbH, Sulzbach, Saar, Germany, Bhavbhuti Pandya, HYDAC Technology Corporation, Bethlehem, PA

11 – 11:30 am | Cause Analysis of Filter Clogging in Power Plant

Daxin Sun, Peng Li, Chao Yang, Dalian Lubricant R&D Institute of Petrochina Lubricant Company, Dalian, China, Zhongguo Liu, Dalian Lubricating Oil Research & Development Institute, Dalian, Liaoning, China

3K | Surface Engineering I

8 – 8:30 am | Probing the Connection Between Surface Topography and Shoe/Floor Friction in Slip-and-Fall Accidents

Tevis Jacobs, Abhijeet Gujrati, Taylor Jones, Kurt Beschoner, University of Pittsburgh, Pittsburgh, PA

8:30 – 9 am | Super-Hydrophilicity of Porous Aluminum Foil

Yuan Yue, Hong Liang, Texas A&M University, College Station, TX

9 – 9:30 am | Surface Engineering of Rough Surface Contacts with Additive Manufacturing

Ali Khoshkhoo, David Blersch, Hamid Ghaednia, Auburn University, Auburn, AL, William Marsh, Rice University, Houston, TX, Andres Carrano, Kamran Kardel, Georgia Southern University, Statesboro, GA

9:30 – 10 am | Surface Treatment of Diamond-Like Carbon for Enhanced Adsorption of Friction Modifiers

Arman Khan, Xingliang He, Hongxing Wu, Michael Desankar, Yip-Wah Chung, Tobin Marks, Qian Wang, Northwestern University, Evanston, IL, Ali Erdemir, Argonne National Laboratory, Argonne, IL

10 – 10:30 am – Break

10:30 – 11 am | Erosion Protection Coatings

Dina Ma, Robert Wood, Terry Harvey, University of Southampton, Southampton, United Kingdom

11 – 11:30 am | An Ultra-Durable Coating Prepared by Depositing B4C with Hydrocarbon/Nitrogen Gas with UNSM Pre-Treatment on Substrate

Zhenneng Ren, Haifeng Qin, Chang Ye, Yalin Dong, Gary Doll, The University of Akron, Akron, OH

11:30 am – Noon | The Preparation of Oil-Containing PS Microcapsules and Their Lubrication Properties

Xu Cao, Dan Guo, Guoshun Pan, Tsinghua University, Beijing, China

3L | Tribochemistry III

Lubricant Additives

8 – 8:30 am | In Situ Real-Time Studies of Reaction Film Formation Temperatures for 5% Tricresyl Phosphate/Base Oil Mixtures in the Presence and Absence of Nanodiamonds

Biplav Acharya, Keshav Avva, Jacqueline Krim, North Carolina State University, Raleigh, NC

8:30 – 9 am | Reach Low Friction by Adjusting Formulation to Match Ring Material

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

9 – 9:30 am | Tribological Performance of Three Different Heat-Treated Steel Systems in the Boundary Lubrication Regime

Leon Wechie, Shahriar Kosarieh, Ardian Morina, Anne Neville, University of Leeds, Leeds, United Kingdom, Shyam Prasad, Marc Ingram, Afton Chemical Ltd., Reading, Bracknell, United Kingdom

9:30 – 10 am | The Effect of Counter Body on ZDDP Tribofilm Formation on Hydrogenated DLC

Lucija Coga, Mitjan Kalin, University of Ljubljana, Ljubljana, Slovenia

10 – 10:30 am – Break

10:30 – 11 am | Mechanochemistry in Full Film, High Shear Stress EHD Conditions

Jie Zhang, Janet Wong, Daniele Dini, Hugh Spikes, Imperial College London, London, United Kingdom

11 – 11:30 am | Controlling Hydrogen Permeation in Bearing Steel – Effect of Base Oil Polarity on ZDDP Film Growth

Vlad Bogdan Niste, Hiroyoshi Tanaka, Joichi Sugimura, Kyushu University, Fukuoka, Japan

11:30 am – Noon | A New Insight Into the Interfacial Mechanisms Involved in the Formation of Tribofilm by Zinc Dialkyl Dithiophosphate

Pourya Parsaeian, Anne Neville, University of Leeds, Leeds, United Kingdom

3M | Condition Monitoring III

8:30 – 9 am | Detection of Abnormal Wear Particles via Electromagnetic Sensor and Particle Imaging Technologies

Thomas Barraclough, Patrick Henning, Spectro Scientific, Chelmsford, MA, Andrew Velasquez, University of California, Merced, Merced, CA, Jordan Saikia, Paul Michael, Milwaukee School of Engineering, Milwaukee, WI

9 – 9:30 am | A New Colorimetric Method to Detect Varnish Precursors

Greg Livingstone, Fluitec, Tucson, AZ, Akira Sasaki, Maintek Consultant, Yokohama, Kanagawa, Japan, Kenji Matsumoto, Honda R&D Co., Ltd., Haga-gun, Tochigi, Japan, Tomomi Honda, University of Fukui, Fukui-shi, Japan

9:30 – 10 am | Used Oil Analysis New Possibilities and Challenges

Anders Petterson, Mattias Holmgren, Luleå University of Technology, Luleå, Sweden

10 – 10:30 am – Break

10:30 – 11 am | Alarm Limit Problems with Trending-Based Solutions

Evan Zabawski, TestOil, Strongsville, OH

11 – 11:30 am | Filterability of Circulation Oil

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

3N | Engine & Drivetrain III Special Session

8 am – Noon | Advanced Fuel-Efficiency Engine and Drivetrain Technologies

Presenters:

- Dr. Dean Tomazic, Executive Vice President and Chief Technology Officer, FEV, Inc.
- Dr. Timothy P. Newcomb, Driveline Lubricants Strategic Technology Manager, The Lubrizol Corporation
- Dr. Chinpei Wang, Tribologist, Cummins, Inc.
- Raj Chandramohan, Staff Engineer, BorgWarner
- Dr. Wolfram Lohse, Chief Technology Officer, Gehring GT

3O | Rolling Element Bearings III

8 – 8:30 am | Investigation of Turbocharger Dynamics Under Acceleration Using a Combined Explicit Finite and Discrete Element Model

Benjamin Conley, Farshid Sadeghi, Purdue University, West Lafayette, IN

8:30 – 9 am | Impact of System Dynamics on Rolling Bearing Cage Stresses

Joerg Binderszewsky, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany

9 – 9:30 am | Tribological Performance of Bearing Materials for Crankshaft Applications Operating Under Mixed Lubrication Conditions

Aleks Vrcek, Pär Marklund, Roland Larsson, Tobias Hultqvist, Luleå University of Technology, Luleå, Sweden

9:30 – 10 am | NVH Calculation on Rolling Element Bearings – Assessment Strategies of Normal Bearing Noise

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

10 – 10:30 am – Break

10:30 – 11 am | Kinematic Equilibrium Analysis of Rollers in Tapered Roller Bearings

Fida Majdoub, NTN-SNR, Annecy, France, Tomoyo Sakaguchi, NTN Corporation, Iwata, Japan, Bruno Mevel, NTN-SNR, Annecy, France

11 – 11:30 am | Detailed Cage Analysis Using CABA3D

Bodo Hahn, Dmitry Vlasenko, Stefanie Gaile, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany

3P | Biotribology III

8 – 8:30 am | The Effects of Exercise on Cartilage Function and Health

David Burris, Steven Voinier, Axel Moore, Jacyln Ulvila, Chris Price, Brian Graham, University of Delaware, Newark, DE

8:30 – 9 am | The Effects of Gender, Age Group, Weight and Height on Biomechanical Properties Related to Slipping

Vani Sundaram, Rakie Cham, Arian Iraqi, Kurt Beschoner, University of Pittsburgh, Pittsburgh, PA, Mahiyar Nasarwanji, Jonisha Pollard, CDC – NIOSH, Pittsburgh, PA

9 – 9:30 am | Tribological Behaviour of Cartilage System in the Static and Boundary Regime

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

9:30 – 10 am | The Effect of Adhesion on Presliding Friction Behavior of Cartilage

Guebum Han, Melih Eriten, University of Wisconsin-Madison, Madison, WI

10 – 10:30 am – Break

10:30 – 11 am | High And Low Friction Regimes In PVA Hydrogels

Marc Masen, Elze Porte, Philippa Cann, Imperial College London, London, United Kingdom

11 – 11:30 am | Contact Mechanics of Articular Cartilage

Steven Voinier, Axel Moore, David Burris, University of Delaware, Newark, DE

11:30 am – Noon | Tribology of Biological Interfaces

Angela Pitenis, Juan Manuel Urueña, Tristan Hormel, Christopher O'Bryan, Padraic Levings, Thomas Angelini, W. Gregory Sawyer, University of Florida, Gainesville, FL

3Q | Synthetics & Hydraulics III

8 – 8:30 am | Ionic Liquids as Lubricants

Abhimanyu Patil, Martin Webster, Satish Bodge, Tezcan Guney, ExxonMobil Research and Engineering, Westfield, NJ

8:30 – 9 am | Influence of Atmosphere on Boundary Film Formation From Ionic Liquids

Erik Nyberg, Ichiro Minami, Luleå University of Technology, Luleå, Sweden

9 – 9:30 am | OSP Based Semi-Synthetic Air Compressor Oil Field Trial

Yaokun Han, Dow Chemical, Shanghai, China

9:30 – 10 am | High Performance Industrial Lubricants Formulated with Renewable Group III+ Base Oil

Paula Vettel, Novvi LLC, Emeryville, CA

10 – 10:30 am – Break

10:30 – 11 am | The Tribological Performance of Gas Turbine Lubricants

Jake Airey, Mark Simmons, Richard Greenwood, University of Birmingham, Birmingham, West Midlands, United Kingdom, Matthew Spencer, Rolls-Royce, Derby, Derbyshire, United Kingdom

11 – 11:30 am | Synthesis and Application of Dibenzyl Toluene as Heat Transfer Fluid

Peng Li, Daxin Sun, Chaoliang Wei, Shaohui Li, Xianzhen Gao, Shubo Sun, Dalian Lubricant R&D Institute of

Petrochina, Dalian, Liaoning, China, Zhongguo Liu, Dalian Lubricating Oil Research & Development Institute, Dalian, Liaoning, China

11:30 am – Noon | Oxidative Degradation of Ester-Based Oils Identified by Isotope Labelling and Mass Spectrometry

Nicole Doerr, Marcella Frauscher, Charlotte Besser, AC2T Research GmbH, Wiener Neustadt, Austria, Günter Allmaier, Vienna University of Technology, Vienna, Austria

4A | Nanotribology II

Wear Processes at the Nanoscale

2 – 3 pm | Dissipation Pathways Upon Sliding a Tip Along the Calcite-Brine Interface

Rosa Espinosa-Marzal, Yijue Diao, University of Illinois at Urbana-Champaign, Urbana, IL

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Development of a Synergetic Wear-Corrosion Model for Prognostics of Nano-Composite Coatings Subject to Tribo-Corrosion Failures

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

4:30 – 5 pm | Superlubricity of Liquid-Like Smooth Solid Surfaces of Covalent Hydrides

Bo Zhang, Saga University, Saga-shi, Saga, Japan

5 – 5:30 pm | Single Atomic Layer Removal of Silicon Via Mechanochemical Reaction

Lei Chen, Southwest Jiaotong University, Chengdu, China

5:30 – 6 pm | In Situ Nano-Tribologic Experiments in Environmental STEM

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

6 – 6:30 pm | In Situ SEM/TEM Nanomechanical Study of Wear and Failure Mechanisms

Eric Hintsala, Douglas Stauffer, Sanjit Bhowmick, Syed Asif, Bruker NI, Minneapolis, MN

4B | Commercial Marketing Forum IV

2 – 2:30 pm | The Lubrizol Corporation

2:30 – 3 pm | Evonik Oil Additives USA, Inc.

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Lubrizol Corporation

4:30 – 5 pm | Eastman

5 – 5:30 pm | LANXESS Corporation

4C | Fluid Film Bearings II

2 – 2:30 pm | Experimental Study of the Influence of the Position, Shape and Number of Journal Scratches on the Performance of a Two-Lobe Journal Bearing

Jean Bouyer, Michel Fillon, Yann Alexandre, Institut Pprime, Futuroscope Chasseneuil Cedex, France

2:30 – 3 pm | The Effect Solid Particle Lubricant Contamination on the Dynamic Behavior of Compliant Journal Bearings

Benyekba Bou-Said, INSA Lyon, Villeurbanne, France, Hamid Bouchrit, Mustapha Lahmar, Guelma University, Guelma, Algeria

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Rotordynamic Relevance of Annular Seals and Journal Bearings with Axial Flowrate

Maximilian Kuhr, Peter Pelz, Gerhard Ludwig, Technische Universität Darmstadt, Darmstadt, Germany

4:30 – 5 pm | Experimental Research on Vibration Reduction Characteristics of Journal Bearings with Metal Mesh Dampers

Xiaoqing Wang, Zhaolun Li, Yifan Shen, Shanghai University, Shanghai, China, Chao Chen, Shanghai University, Shanghai, China

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

4D | Materials Tribology II

Solid Lubricants, Coatings, and 2D Materials

2 – 2:30 pm | DLC from Thin Air: In Situ Formation of DLC on Ultralow Wear Metals

Nicolas Argibay, Timothy Furnish, Tomas Babuska, John Curry, Brendan Nation, Andrew Kustas, David Adams, Ping Lu, Michael Dugger, Michael Chandross, Sandia National Laboratories, Albuquerque, NM

2:30 – 3 pm | Analysis of Transfer Mechanisms of Solid-Lubricated Rolling Bearings

Sascha Poersch, Bai-Cheng Jim, Stefan Emrich, Bernd Sauer, Bernd Wetzel, Michael Kopnarski, TU Kaiserslautern, Kaiserslautern, Germany

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | High Temperature Friction and Wear Behavior of Cold-Sprayed Ti₆Al₄V and Ti₆Al₄V-TiC Composite Coatings

Thomas Scharf, Tyler Torgerson, The University of North Texas, Denton, TX, Venkata Munagala, Richard Chromik, McGill University, Montreal, Quebec, Canada

4:30 – 5 pm | Development of Alumina-Based Self-Lubricating Materials for High-Temperature Application

Ashish Kasar, Arpith Siddaiah, Pradeep Menezes, University of Nevada-Reno, Reno, NV

5 – 5:30 pm | Establishing a Tribological Approach to Evaluate Hard Chromium Replacements for Industrial Applications

Emmanuel Georgiou, Dirk Drees, Herman Van Hest, Falex Tribology NV, Rotselaar, Belgium, Greet Timmermans, Tenneco, Sint-Truiden, Belgium, Jorgen Sabbe, Wienerberger, Kortrijk, Belgium, Victor Crespo, Cromomex S.A., Valencia, Belgium

4E | Lubrication Fundamentals IV

2 – 2:30 pm | Connecting Discontinuous and Continuous Tribological Models

Guytri Kastane, Institut Pprime, Futuroscope Chasseneuil Cedex, France, Noel Brunetiere, Institut Pprime – CNRS, Futuroscope, France, Mathieu Renouf, CNRS, Montpellier, France

2:30 – 3 pm | Simulation of Rubber Friction: Comparison to Pin-On-Disc Measurement Results

Fabian Kaiser, Andreas Gropp, Ravindrakumar Bactavatchalou, Freudenberg Technology Innovation SE & Co. KG, Weinheim, Germany

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | The Effect of Roughness Orientation on Friction and Film Thickness Under Transition to Mixed Lubrication

Petr Sperka, Tomas Zapletal, Ivan Krupka, Martin Hartl, Brno University of Technology, Brno, Czechia

4:30 – 5 pm | Experimental Analysis of Chromium Molybdenum (CrMo) Coated Specimens Under EHL Contact for Film Thickness, Friction, and Wear Characterization

David Pickens, Zhong Liu, Xingliang He, Takayuki Nishino, Qian Wang, Northwestern University, Evanston, IL

5 – 5:30 pm | Influence of Surface Roughness on Tribofilm Formation in Rolling/Sliding Heavily Loaded Contacts

Jonny Hansen, Marcus Björling, Roland Larsson, Machine Elements, Luleå University of Technology, Luleå, Sweden

5:30 – 6 pm | Lubrication Fundamentals Business Meeting

4F | Wear IV

2 – 2:30 pm | Multiphysical Investigations on the Local Behaviour of Railroad Brake Pad

Eric Chapteuil, PhD Student, Lyon, France, Mathieu Renouf, CNRS, Montpellier, France, Yves Berthier, INSA Lyon, Villeurbanne, France

2:30 – 3 pm | Analysis of Rolling Contact Fatigue on Aeronautic Gears

Guillaume Vouaillat, Fabrice Ville, Christophe Changenet, Laboratoire de Mécanique des Contacts et des Structures, Villeurbanne, France, Jean-Philippe Noyel, ECAM, Lyon, France, Xavier Kleber, Mateis, Villeurbanne, France, Sylvain Rathery, Safran Transmission Systems, Colombes, France

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Modelling and Optimization for Abrasive Sliding Wear of Composite Systems

Xiu Jia, Tomas Grejtak, Annaliese Cuniffe, Yupin Shi, David Kauffman, Sam Joynson, Zirui Peng, Mahesh Ghag, Brandon Krick, Natasha Vermaak, Lehigh University, Bethlehem, PA

4:30 – 5 pm | Abrasion Resistance of 304L and 316L Stainless Steel Subjected to Deep Cryogenic Treatment

Paulo Herrera, Tom Slatter, The University of Sheffield, Sheffield, South Yorkshire, United Kingdom, Rob Thornton, University of Leicester, Leicester, United Kingdom

5 – 5:30 pm | The Surface Layer Analysis of Grooved Journal Bearings After Abrasive Tests

Jaroslav Sep, Lidia Galda, Leszek Tomczewski, Rafal Oliwa, Rzeszow University of Technology, Rzeszow, Poland

4G | Metalworking IV

2 – 2:30 pm | Closed Cage IF-WS₂ Particles as Superior AF/AW/EP Additive in Synthetic and Semi-Synthetic Metalworking Fluid

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

2:30 pm – 3 pm | Increased Hard Water Tolerance of MWF

Robert Golden, Pilot Chemical Company, Cincinnati, OH

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Functional Organosilanes/Organic Acids Combo Systems as Stain/Corrosion Inhibitors in Metalworking Fluids for Application on Aluminum Alloys

Hoon Kim, Joana Costa, Chemetall-BASF, New Providence, NJ

4:30 – 5 pm | New Designed Self-Emulsifying Ester for MWFs

Siao-Han Yang, Jeng-Shiang Tsaih, Hsu-Hua Tang, Jung-Tsing Hung, Patech Fine Chemicals Co., Ltd., Changhua County, Taiwan

5 – 5:30 pm | The Potential of Siloxane Defoamers – Increased Cooling and Reduced Misting in MWF

Kai Wirz, David Previs, Deborah Lewis, Evonik Nutrition & Care GmbH, Essen, Germany

5:30 – 6 pm | Further Exploration of the Effects of Aluminium Testing Specimens in Bench Testing of Machining Fluids

Katherine Helmetag, Henkel Corporation, Madison Heights, MI, Dirk Drees, Emmanuel Georgiou, Falex Tribology NV, Rotselaar, Belgium

4H | Contact Mechanics II

2 – 2:30 pm | Uncertainty Quantification of Friction Model Parameters for Joint Mechanics Applications

Matthew Brake, Zilu Guo, Rice University, Houston, TX

2:30 – 3 pm | Contact Measurements of Randomly Rough Surfaces With Varying Root Mean Square Roughness and Surface Adhesion

Alexander McGhee, Eric McGhee, Kyle Schulze, Thomas Angelini, W. Gregory Sawyer, Peter Ifju, University of Florida, Gainesville, FL

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | A Finite Element Study of an Elastic-Plastic Axisymmetric Sinusoidal Surface Asperity Contact Against a Rigid Flat With Strain Hardening

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

4:30 – 5 pm | Influence of Surface Roughness and Material Properties on Interface Compliance and Damping

Lejie Liu, Melih Eriten, University of Wisconsin-Madison, Madison, WI

5 – 5:30 pm | The Effect of Surface Roughness and Multiaxial Vibrations on the Energy Dissipation of Flat-on-Flat Contacts

Ahmet Usta, Melih Eriten, University of Wisconsin-Madison, Madison, WI

4I | Grease II

2 – 2:30 pm | A Master Curve for the Shear Degradation of Lubricating Rolling Bearing Greases

Yuxin Zhou, Rob Bosman, University of Twente, Enschede, Netherlands, Piet Lugt, SKF Research and Technology Development, Nieuwegein, Netherlands

2:30 – 3 pm | Influence of Surface Texture on Grease Lubrication

Adrian Predescu, Victor Marian, Nicolae Stoica, University Politehnica of Bucharest, Bucharest, Romania, Ionut Nicolae, National Institute for Laser, Plasma and Radiation Physics, Bucharest, Romania, Cristian Gheorghe, JNO Group, Jilava, Romania

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Film Thickness in a Grease Lubricated Ball Bearing

Yuxin Zhou, Rob Bosman, University of Twente, Enschede, Netherlands, Piet Lugt, SKF Research and Technology Development, Nieuwegein, Netherlands

4:30 – 5 pm | The Influence of Rheological Properties of Grease on Replenishment at Contact Inlet in Ball Bearings

Michita Hokao, Kentaro Sonoda, NSK Ltd., Fujisawa, Kanagawa, Japan, Joichi Sugimura, Kyushu University, Fukuoka, Fukuoka, Japan

5 – 5:30 pm | Nano Structure Urea Grease: Performance and Application

Akihiro Shishikura, Hideki Nakata, Idemitsu Kosan Co., Ltd., Ichigara, Chiba, Japan

5:30 – 6 pm | Grease Business Meeting

4K | Surface Engineering II

2 – 2:30 pm | The Effect of Contact Pressure on the Wear and Mechanical Properties of Metallic/Ceramic Nanolaminates

Marian Kennedy, Bradley Schultz, Clemson University, Clemson, SC

2:30 – 3 pm | Mechanical & Surface Engineering by Friction-Stir Processing

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

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Tribological Studies of Textured Surfaces Fabricated by Micro/Nano-scale Additive Manufacturing and Hard Coated by Atomic Layer Deposition

Mahyar Afshar Mohajer, Qian Sun, Xiangbo Meng, Min Zou, University of Arkansas, Fayetteville, AR

4:30 – 5 pm | Surface Designs for Friction Control

Stephen Hsu, Govindaiah Patakamuri, Fei Zhao, The George Washington University, Washington, DC

5 – 5:30 pm | Bionic Surface Textures and Wall Slip for Reducing High-Speed Train Skin Noise

Shaofeng Xu, Ningbo Institute of Technology, Zhejiang University, Ningbo, Zhejiang, China, Qian Wang, Northwestern University, Evanston, IL, Jiugen Wang, Zhejiang University, Hangzhou, China

4L | Tribochemistry IV

Ionic and Solid Lubricant Additives

2 – 2:30 pm | Phosphonium Cation Based Ionic Liquid Lubricant Additives: Frictional Transitions and Film Formation in Steel Boundary Conditions

Jon-Erik Mogonye, Stephen Berkebile, Nikhil Murthy, US Army Research Laboratory, Aberdeen Proving Ground, MD

2:30 – 3 pm | Tackling Tribological Challenges with Electromagnetically Responsive Nanofluid Lubricants

Monica Ratoi, Lahiru Lokuwithana, University of Southampton, Southampton, United Kingdom

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | In Situ Generation of Transition Metal Dichalcogenide Tribofilms: Potentials and Applications

Manel Rodriguez Ripoll, Vladimir Totolin, AC2T Research GmbH, Wiener Neustadt, Austria, Agnieszka Tomala, Institute for Sustainable Technologies, Radom, Poland, Ichiro Minami, Lulea University of Technology, Lulea, Sweden

4:30 – 5 pm | Tribological Behaviour of Plasma Functionalized Multilayer Graphene Nanofluids

Ricardo Bordignon, Diego Salvaro, Cristiano Binder, Aloisio Klein, Valderes Drago, Jose Daniel De Mello, Universidade Federal de Santa Catarina, Florianopolis, Santa Catarina, Brazil

5 – 5:30 pm | High Throughput and Multi-Scale Quantum-Mechanics/Molecular-Mechanics Calculations Applied to Lubricants

M. Clelia Righi, University of Modena and Reggio Emilia, Modena, Italy

4M | Condition Monitoring IV

2:30 – 3 pm | Opportunities for Remote Emissions Sensing to Determine Maritime Vessel MARPOL Compliance

Michael Plumley, Joshua Pennington, US Coast Guard Academy, New London, CT

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | A Study of Varnish-Forming Oil Oxidation Products in Relation to Their Molecular Weights, Their Solubility in Oils and Their Colors

Tomohiko Kon, Graduate School of University of Fukui, Fukui-shi, Fukui, Japan, Akira Sasaki, Maintek Consultant, Yokohama, Kanagawa, Japan, Tomomi Honda, University of Fukui, Fukui-shi, Fukui, Japan, Kenji Matsumoto, Honda R&D Co., Ltd., Haga-gun, Tochigi, Japan

4:30 – 5 pm | A Study of the Adhesive Forces of Varnish-Forming Oil Oxidation Products

Akira Sasaki, Maintek Consultant, Yokohama, Kanagawa, Japan, Tomomi Honda, University of Fukui, Fukui-shi, Fukui, Japan, Kenji Matsumoto, Honda R&D Co., Ltd., Haga-gun, Tochigi, Japan

4N | Engine & Drivetrain IV

Special Session

2 pm – 2:30 pm | Motored Friction Evaluation of a Heavy Duty Diesel Engine with Ultra-Low HTHS Oils

Jordan Kelleher, Erick Tijerino, Cummins Inc., Columbus, IN

2:30 – 3 pm | Engine Oil Fuel Economy – Why Lower Viscosity Is Not Always The Correct Answer

William Anderson, Afton Chemical Corporation, Richmond, VA

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30pm | Influence of Engine Lubricant Additives on Soot Wear

Artemis Kontou, Shell University Technology Center, Imperial College London, London, United Kingdom, Hugh Spikes, Imperial College London, London, United Kingdom, Mark Southby, Shell Global Solutions, London, United Kingdom

4:30 – 5 pm | Impact of VI-Improver on the Formation of Piston Deposits in Fuel Efficient Engine Oils

Boris Eisenberg, Evonik Industries AG, Darmstadt, Germany

5 – 5:30 pm | Motored Engine Testing to Evaluate 5W20 Grade Oils for Improved Frictional Performance

Gagan Srivastava, John Cuthbert, Fabio D'Ottaviano, The Dow Chemical Company, Lake Jackson, TX

4O | Rolling Element Bearings IV

2 – 2:30 pm | Frictional Work in Oscillating Ball Bearings – Simulation of Ball Motion and Sliding Friction

Fabian Schwack, Gerhard Poll, Institute of Machine Design and Tribology, Hannover, Germany

2:30 – 3 pm | An Experimental Study into the Mechanism of False Brinelling Contact Damage

Rachel Januszewski, Amir Kadiric, Imperial College London, London, United Kingdom, Victor Brizmer, SKF, Nieuwegein, Netherlands

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Experimental Study of the Replenishment in EHL Contact Lubricated by Oils and Greases

David Kostal, Petr Sperka, Ivan Krupka, Martin Hartl, Brno University of Technology, Brno, Czechia

Tuesday, May 22

4:30 – 5 pm | In Situ Measurement of Lubricating Grease Films in a Model Rolling Bearing

He Liang, Amir Kadiric, Imperial College London, London, United Kingdom, Piet Lugt, SKF Engineering and Research Centre, Enschede, Netherlands

5 – 5:30 pm | Rolling Element Bearings Business Meeting

4P | Biotribology IV

2 – 2:30 pm | 3D Printed Biocompatible PCU/UHMWPE for Artificial Knee Meniscus

Raissa Araujo Borges, Dipankar Choudhury, Min Zou, University of Arkansas, Fayetteville, AR

2:30 – 3 pm | An In Situ Observation of Dimple Shape Effects on the Lubricant Film Formation in Artificial Hip Joints

Dipankar Choudhury, University of Arkansas, Fayetteville, AR, David Rebenda, Martin Vrbka, Brno University of Technology, Brno, Czechia, Shinya Sasaki, Tokyo University of Science, Tokyo, Japan, Min Zou, University of Arkansas, Fayetteville, AR

3 – 4 pm – Exhibitor Appreciation Break

4 – 4:30 pm | Study on the Biotribological Behaviors of an Artificial Cervical Disc with a Bearing Surface of Ti6Al4V on UHMWPE

Song Wang, Weiqiang Liu, Research Institute of Tsinghua University, Shenzhen, Guangdong, China

4:30 – 5 pm | Understanding the Role of Tribology in Maintaining Oral Hygiene

Mahdiyyah Baig, Robert Wood, Richard Cook, University of Southampton, Southampton, United Kingdom, Jonathan Pratten, GlaxoSmithKline, Weybridge, United Kingdom

5 – 5:30 pm | Friction Characteristics on the Real Touch Feeling of Handwriting with the Stylus Pens

Youngze Lee, Jinhwak Park, Sungkyunkwan University, Suwon, Geonggido, Republic of Korea

Wednesday, May 23, 2018

5A | Nanotribology III

Impact of Mechanics on Nanoscale Tribological Phenomena

8 – 9 am | Invited Talk

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

9 – 9:30 am | Investigation of Interface Resistivity and Load-Dependent Conduction of a Platinum Nanocontact Using In Situ Transmission Electron Microscopy

Sai Bharadwaj Vishnubhotla, Subarna Khanal, Tevis Jacobs, University of Pittsburgh, Pittsburgh, PA, Rimei Chen, Xiaoli Hu, Ashlie Martini, University of California, Merced, Merced, CA, Jing Li, Stony Brook University, Stony Brook, NY, Eric Stach, University of Pennsylvania, Philadelphia, PA

9:30 – 10:00 am | Mapping the Atomic-Scale Mechanical Properties on Well-Defined Surfaces

Philip Egberts, Zahra Abooli Zadeh, University of Calgary, Calgary, Alberta, Canada, Xiaoli Hu, Ashlie Martini, University of California, Merced, Merced, CA

10 – 10:30 am – Break

10:30 – 11 am | MD Simulations of Friction and Wear of CHJC Fuel Surrogates

Judith Harrison, Brian Morrow, Sabina Maskey, US Naval Academy, Annapolis, MD, J. David Schall, Oakland University, Rochester, MI

11 – 11:30 am | A New Force Field Developed for Interfacial Interactions Between Graphene and Hexadecane

Hongyu Gao, Sergey Sukhomlinov, Martin Muser, Saarland University, Saarbrücken, Germany

11:30 am – Noon | Probing the Friction Behavior of BCC Metals

Adam Hinkle, John Curry, Andrew Kustas, Nicolas Argibay, Michael Chandross, Sandia National Laboratories, Albuquerque, NM

5B | Commercial Marketing Forum V

8 – 8:30 am | Calumet Specialty Products Partners, LP

8:30 – 9 am | Biosynthetic Technologies

9 – 9:30 am | Evonik Oil Additives USA, Inc.

9:30 – 10 am | The Lubrizol Corporation

10 – 10:30 am – Break

10:30 – 11 am | Afton Chemical Corporation

11 – 11:30 am | Afton Chemical Corporation

11:30 am – Noon | Lockhart Chemical Company

5C | Fluid Film Bearings III

8:30 – 9:00 am | Study in the Frequency Domain of Cavitated Squeeze Film Dampers

Sorin Cioc, Sai Venkata Kothareddy, Carmen Cioc, The University of Toledo, Toledo, OH

9 – 9:30 am | Transient Response of a Squeeze Film Damper to Impact Loads: Experiments and Predictions

Bonjin Koo, Luis San Andres, Texas A&M University, College Station, TX, Sung-Hwa Jeung, Ingersoll Rand, La Crosse, WI

9:30 – 10 am | Vibration Reduction of Radial Damping Bearings with Hydraulic Servo Control System

Yifan Shen, Xiaojing Wang, Chao Chen, Zhaolun Li, Shanghai University, Shanghai, China

10 – 10:30 am – Break

10:30 – 11 am | Investigation of Fluid Flow in a Pocketed Thrust Bearing Using PIV

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

11 – 11:30 am | Performance of Hydrostatic Thrust Pad Bearings Operating with Electrically Conducting Lubricant

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

11:30 am – Noon | Numerical and Experimental Study of Active Thrust Fluid Film Bearings with Fixed Pads

Alexander Babin, Leonid Savin, Alexey Kornaev, Orel State University, Orel, Russian Federation

5D | Materials Tribology III

Polymers and Gels

8 – 8:30 am | Control Over Counterface Topography as a Means to Elucidate Transfer Film Development

Kazi I. Alam, David Burris, University of Delaware, Newark, DE, Jiaxin Ye, Bo Tao, Wei Sun, Kun Liu, Hefei Institute of Technology, Anhui, Hefei, China

8:30 – 9 am | Effects of Polyamide-Imide as a Wear Additive in Thermoplastic Compounds

Stephen Gurchinoff, Solvay, Wauwatosa, WI, Isaac Ballinas, Allegheny Performance Plastics, Leetsdale, PA

9 – 9:30 am | Ultra-Low Wear of Polytetrafluoroethylene Composites

Morgan Jones, Angela Pitenis, Juan Manuel Uruña, Samantha Marshall, Samuel Hart, W. Gregory Sawyer, University of Florida, Gainesville, FL

9:30 – 10 am | Tribological Behavior of Multiphase Polymeric Systems

Mohammad Hossain, Vijay Kisan Chandelia, Texas A&M University-Kingsville, Kingsville, TX, Hung-Jue Sue, Texas A&M University, College Station, TX

10 – 10:30 am – Break

10:30 – 11 am | Assessing the Performance of Ultra-Low Wear PTFE-Based Triboblends in Deionized Water

Kasey Campbell, Mark Sidebottom, Cooper Atkinson, Kyle Kirk, Christopher Junk, Brandon Krick, Lehigh University, Bethlehem, PA

11 – 11:30 am | Microstructural and Chemical Changes to Perfluoroalkoxy Polymer (PFA) During Sliding

Mark Sidebottom, Christopher Junk, Brandon Krick, Lehigh University, Bethlehem, PA, Heidi Burch, Greg Blackman, Holly Salerno, E.I. du Pont de Nemours and Company Inc., Wilmington, DE

11:30 am – Noon | The Effects of Coating Thickness on the Tribological Properties of PDA/PTFE Coatings

Yang Zhao, Min Zou, University of Arkansas, Fayetteville, AR

5E | Lubrication Fundamentals V

8:30 – 9:00 am | Ammonium Versus Phosphonium Cation-Based Ionic Liquids as Neat Lubricants: Physicochemical, Environmental and Tribological Behavior

David Blanco, Rubén González, Jose Luis Viesca, Alfonso Fernández-González, Paula Oulego, Antolín Hernández-Battez, University of Oviedo, Gijón, Spain

9 – 9:30 am | Tribofilm Formation Mechanisms in an Ionic Liquid-Additized Lubricant

Yan Zhou, Donovan Leonard, Wei Guo, Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN

9:30 – 10 am | Investigation on the Thermophysical and Lubricity Characteristics of a Mineral Oil Modified with MWCNT and Nanoclay Additives

Hiralal Bhowmick, Harpreet Singh, Thapar University, Patiala, Punjab, India

10 – 10:30 am – Break

10:30 – 11 am | New Designed Polymeric Organic Friction Modifier

Wei-Chieh Liang, Jeng-Shiang Tsaih, Jung-Tsing Hung, Hsu-Hua Tang, Patech, Changhua County, Taiwan

11 – 11:30 am | Temperature and Time Dependent Tribological Studies For Developing Lubricant Friction Modifier Systems and Following the Friction Reduction Component of Fuel Economy

Frank DeBlase, LANXESS Solutions US, Inc., Naugatuck, CT

11:30 am – Noon | Expand the Potential of Additives by Microencapsulation

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

5F | Wear V

8 – 8:30 am | New Trends in Anti-Wear Additives to Face the Lubricant Industry Challenges

Patrick Moreau, Solvay, Aubervilliers, France

8:30 – 9 am | Study of the Interfacial Mechanism of ZDDP Tribofilm in Humid Environment and Its Effect on Tribochemical Wear

Pourya Parsaeian, University of Leeds, Leeds, United Kingdom, Anne Neville, IFS, Leeds, United Kingdom

9 – 9:30 am | Seawater Induced Tribocorrosion of Marine Alloys and Coatings

Robert Wood, University of Southampton, Southampton, United Kingdom

9:30 – 10 am | Evaluation of Corrosion Inhibitors During Simultaneous Sliding and CO₂ Corrosion for the Oil and Gas Industry

Manel Rodriguez Ripoll, Andreas Trausmuth, Vladimir Totolin, Ewald Badisch, AC2T Research GmbH, Wiener Neustadt, Austria

10 – 10:30 am – Break

10:30 – 11 am | Cutting Tool Materials Niobium Carbide (NbC) Substituting Tungsten Carbide and Cermets

Mathias Woydt, BAM, Berlin, Germany, Hardy Mohrbacher, NiobelCon bvba, Schilde, Belgium

11 – 11:30 am | Development of a Mechano-Wear Model for Prognostics of Nano-Composite Coatings Subject to the Reciprocating Wear Failures

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

5G | Environmentally Friendly Fluids

I-EFF Base Oils and Additives

8 – 8:30 am | Is the Drive for Sustainability Fueling Growth in Biodegradable Lubricants?

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

8:30 – 9 am | Estolides – New Developments and Benefits

Jake Bredsguard, Biosynthetic Technologies, Irvine, CA

9 – 9:30 am | Structural Effects on Viscosity and Pour Point Trends of Fatty Acid-Based Lubricants

Daniel Garbark, Jeffrey Cafmeyer, Mark Perry, Battelle Memorial Institute, Columbus, OH

9:30 – 10 am | High-Performance Lubricants Produced from Renewable Group III+ Base Oils

Sunhwa Lee, Dante Yang, Dzmitry Malevich, Chad Joshi, Advonex International, Brockville, Ontario, Canada, Gefei Wu, Frances Lockwood, Valvoline LLC, Lexington, KY

10 – 10:30 am – Break

10:30 – 11 am | HEPR Environmentally Acceptable Lubricants Polymer Thickened Make Excellent Products for Hydraulic, Gear, Stern and Thruster Oils

Doug Adams, RSC Bio Solutions, Indian Trail, NC

11 – 11:30 am | Fatty Amine/ZDDP Interaction: Effect of Tallow Amine on Tribofilm Morphology, Durability and Film Formation Capability of ZDDP

Muhammad Siddiqui, Anne Neville, Ardian Morina, University of Leeds, Leeds, United Kingdom, Johanna Speelman, AkzoNobel, Deventer, Netherlands

11:30 am – Noon | Biodegradable Multifunctional Additives for Lube Oil – Synthesis and Characterization

Pranab Ghosh, Mahua Upadhyay, Gobinda Karmakar, University of North Bengal, Siliguri, West Bengal, India

5H | Contact Mechanics III

8 – 8:30 am | Eliminating the Surface Location from Soft Matter Contact Mechanics Measurements

Daniel Garcia, Kyle Schulze, Christopher O'Bryan, Tapomoy Bhattacharjee, W. Gregory Sawyer, Thomas Angelini, University of Florida, Gainesville, FL

8:30 – 9 am | Recent Advancements in Constant Pressure Probes for Low Pressure Applications

Kylie Van Meter, Kyle Schulze, Samuel Hart, Juan Manuel Uruena, Samantha Marshall, Angela Pitenis, W. Gregory Sawyer, University of Florida, Gainesville, FL

9 – 9:30 am | A Tale of Two Hydrogels: Soft Semi-Flexible Polymers and Collagen

Kyle Schulze, Cameron Morley, Yongliang Ni, Thomas Angelini, W. Gregory Sawyer, University of Florida, Gainesville, FL

9:30 – 10 am | In Situ Measurements of Full-Field Deformation in Soft Hydrogels Due to Sliding Contact

Alexander McGhee, Eric McGhee, Jack Famiglietti, Kyle Schulze, W. Gregory Sawyer, Thomas Angelini, Peter Ifju, University of Florida, Gainesville, FL

10 – 10:30 am – Break

10:30 – 11 am | How Do Different Classes of Hydrogels Respond to Contact Forces?

Thomas Angelini, University of Florida, Gainesville, FL

11 – 11:30 am | Optical In Situ Micro Tribometer for Analysis of Real Contact Area for Adhesive and Frictional Contact Mechanics

Tomas Grejtak, Michael Sedaille, Brandon Krick, Lehigh University, Bethlehem, PA

11:30 am – Noon | Effect of Load and Current on Triboelectric Behavior of Cu Rolling Contact Pairs

Chenfei Song, Henan University of Science and Technology, Luoyang, Henan, China

5I | Surface Engineering III

8 – 8:30 am | Surface Topography in Inconel 625 Made with Binder-Jet Additive Manufacturing: Measurement, Modification, and Effects on Fatigue

S. Harsha Vardhan Neelapu, Amir Mostafaei, Cameron Kisailus, Erica Stevens, Katerina Kimes, Markus Chmielus, Tevis Jacobs, University of Pittsburgh, Pittsburgh, PA

8:30 – 9 am | Development of a Mechano-Electrochemical Model for Prognostics of Nano-Composite Coatings Subject to Corrosion Failures

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

9 – 9:30 am | Icephobic Surface Design and Measurement

Stephen Hsu, Govindaiah Patakamuri, The George Washington University, Washington, DC

9:30 – 10 am | Influence of Machining Angle and Solid Lubricants in a Bio-Lubricant Medium

Pradeep Menezes, Arpith Siddaiah, Ashish Kasar, University of Nevada-Reno, Reno, NV

10 – 10:30 am – Break

10:30 – 11 am | Investigation and Fabrication of Multi-Functional Nanoparticle Surface Coatings for Wear-Corrosion Synergistic Resistance

Arpith Siddaiah, Pradeep Menezes, University of Nevada-Reno, Reno, NV, Muhammad Usman Bhutta, Zulfiqar Khan, Bournemouth University, Poole, Dorset, United Kingdom

11 – 11:30 am | Local Heat Treatment with and without Ultrasonic Nanocrystal Surface Modification of Inconel 718 Alloy: Microstructure, Mechanical Properties and Fretting Wear Relationship

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

11:30 am – Noon | Effect of Micro/Nano Dimple Textured Surface on Friction & Wear Under Elastic/Plastic Contact

Muthukumar Mariappan, Tokyo University of Science, Tokyo, Japan

5J | Engine & Drivetrain V

8 – 8:30 am | Experimental Investigations of Sliding on Tripod Constant Velocity Joints

Valentin Ripard, LaMCoS – INSA LYON/LTDS – Centrale Lyon/PSA Groupe, Villeurbanne, France, Jérôme Cavoret, Michal Ruzek, Fabrice Ville, LaMCoS INSA Lyon, Villeurbanne, France, Clotilde Minfray, LTDS – Centrale Lyon, Ecully, France, Fabrice Dassenoy, LTDS – Centrale Lyon, Ecully, France, Moussa Diaby, PSA Groupe, Vélizy, France

8:30 – 9 am | Wear Investigations on Timing Chains Using a Chain Joint Tribometer

Andre Becker, Bernd Sauer, Institute of Machine Elements, Gears, and Transmissions, University of Kaiserslautern, Kaiserslautern, Germany

9 – 9:30 am | Global Model for Predicting Power Losses in a Planetary Gear Set

Jean-Baptiste Boni, INSA Lyon – ECAM Lyon, Lyon Cedex 05, France, Christophe Changenet, ECAM Lyon, Lyon, France, Fabrice Ville, INSA Lyon, Villeurbanne, France

9:30 – 10 am | The Benefits of Novel Functionalized Viscosity Index Improvers in Wet Clutch Systems

Alexei Kurchan, Evonik Oil Additives, Horsham, PA, Jennifer Holtzinger, Sebastian Seibel, Alexandra Pauker, Evonik Industries AG, Darmstadt, Germany

10 – 10:30 am | An Investigation of Wear Mechanisms and Lubricant Effects in Silent Timing Chains

Ramoun Mourhatch, Seyedeh Mahboobeh Hosseini, Chevron Oronite LLC, Richmond, CA

10:30 – 11 am | Measuring Tappet Rotation in a Valvetrain Rig Under the Presence of MoDTC-Type Friction Modifier

Yasir Al-Jeboori, University of Leeds, Leeds, United Kingdom

11 – 11:30 am | Lubrication Analysis of Interface of Textured Top Piston Ring and Cylinder Liner of an IC Engine for Improving the Tribo-Performances

A. Atulkar, R.K. Pandey, P.M.V. Subbarao, Indian Institute of Technology Delhi, New Delhi, India

5K | Rolling Element Bearings V

8 – 8:30 am | Bearing Maintenance Trends in the US Air Force Fleet from 1984-2015

Justin Mason, AFRL, Wright-Patterson Air Force Base, OH, Hitesh Trivedi, UES Inc., Dayton, OH

8:30 – 9 am | NiTi Alloys for Aerospace Applications

Christopher DellaCorte, Samuel Howard, NASA, Cleveland, OH

9 – 9:30 am | Enhanced Ester (MIL-PRF-23699G) Gas Turbine Engine Lubricant Degradation with VIM VAR M50 Bearings

Hitesh Trivedi, David Gerardi, UES Inc., Dayton, OH, Douglas Toth, Ruth Girouard, UDRI, Dayton, OH, Patrick Hellman, Garry Givan, AFRL, Wright-Patterson Air Force Base, OH

9:30 – 10 am | Modeling of the Surface Stress to Form Traction Cracks Under Oil-Out Conditions

Robert Homan, Nelson Forster, William Black, Lavern Wedeven, Wedeven Associates Inc., Edgmont, PA, Steven Peters, J.V. Poplawski and Associates Inc., Bethlehem, PA

10 – 10:30 am – Break

10:30 – 11 am | Numerical Investigations on Drag Coefficient of Cylinders for Power Loss Prediction in Cylindrical Roller Bearings

Yann Marchesse, Christophe Changenet, ECAM-Lyon, Lyon, France, Fabrice Ville, INSA Lyon, Villeurbanne, France

11 – 11:30 am | Thermal Modeling of EHD Contacts Using Closed Form Solutions

Nelson Forster, Steven Kratz, Robert Homan, William Black, Wedeven Associates Inc., Edgmont, PA

6A | Nanotribology IV

Two Dimensional Lubricants

1:30 – 2:30 pm | Invited Talk

Tobin Fillete, University of Toronto, Toronto, Ontario, Canada

2:30 – 3 pm | The Role of Interfaces on Friction and Deformation Characteristics of Atomically Thin 2D Transition Metal Di-chalcogenides

Praveena Manimunda, Syed Asif, Bruker Nano Surfaces, Eden Prairie, MN, Sandhya Susarala, Chandrasekhar Tiwari, Pulickel Ajayan, Rice University, Houston, TX

3 – 3:30 pm – Break

3:30 – 4 pm | Nanotribological Properties of Petroleum-Derived Lubricants on Graphene-Coated Surfaces

Prathima Nalam, Behnoosh Sattari Baboukani, University of Buffalo, Buffalo, NY

4 – 4:30 pm | Effect of Corrosion Propagation Through the Cracks in Atomically Thin Protective Layers on Material Interactions with Surrounding Media

Diana Berman, The University of North Texas, Denton, TX

4:30 – 5 pm | Effect of Humidity and Water Intercalation on the Tribological Behavior of Graphene Oxide (GO) Nanosheets

Taib Arif, Guillaume Colas, Tobin Fillete, University of Toronto, Toronto, Ontario, Canada

5 – 5:30 pm | Nanotribological Properties of MoS₂ Intercalation Compounds

Zhiwei Chen, Tsinghua University, Beijing, China

5:30 – 6 pm | Nanotribology Business Meeting

6B | Commercial Marketing Forum VI

1:30 – 2 pm | Available Time Slot

2 – 2:30 pm | Vanderbilt Chemicals, LLC

6C | Fluid Film Bearings IV

1:30 – 2 pm | Effect of Wear on the Static Performance Characteristics of Non-Recessed Hole Entry Hydrostatic Conical Journal Bearing

Vikas Phalle, Sanjay Pawar, V.J.T. I. Mumbai, India, Mumbai, Maharashtra, India

2 – 2:30 pm | A Low-Flux Polyurethane Restrictor for High-Stiffness Hydrostatic Bearing Over a Wide Range of Loading

Sy-Wei Lo, You-Yi Lin, Jyh-Chyang Renn, National Yunlin University of Science & Technology, Douliu City, Yunlin County, Taiwan, Tsuo-Fei Mao, Chienkuo Technology University, Changhua, Taiwan

2:30 – 3 pm | Research on Bearing Fluctuation of Oil Film in Hydrostatic Turntable

Caixia Zhang, Zhifeng Liu, Yumo Wang, Beijing University of Technology, Beijing, China

3 – 3:30 pm – Break

6D | Materials Tribology IV

Polymers and Gels

1:30 – 2 pm | The Difference Between Static and Dynamic Friction

Bart Weber, ARCNL, Amsterdam, Netherlands, Tomislav Suhina, Fred Brouwer, Daniel Bonn, University of Amsterdam, Amsterdam, Netherlands

2 – 2:30 pm | On the Mechanism of Shoe Versus Walking Surface Friction

Kenneth Budinski, Bud Labs, Rochester, NY

2:30 – 3 pm | Effect of Environmental Gas on Friction and Wear of Rubbers With Silicon Nitride in Reciprocating Sliding Contact

Joichi Sugimura, Hiroyoshi Tanaka, Kazumi Okada, Kyushu University, Fukuoka, Japan

3 – 3:30 pm – Break

3:30 – 4 pm | Normal Load Effects on Hydrogel Friction

Juan Manuel Uruena, Eric Mcghee, Angela Pitenis, Thomas Angelini, W. Gregory Sawyer, University of Florida, Gainesville, FL

4 – 4:30 pm | History-Dependent Hydrogel Lubrication and A Model Based on Structural Buildup and Breakdown

Jiho Kim, Alison Dunn, University of Illinois at Urbana-Champaign, Urbana, IL

4:30 – 5 pm | The Role of Temperature in Hydrogel Lubricity

Eric Mcghee, Juan Manuel Uruena, Angela Pitenis, W. Gregory Sawyer, University of Florida, Gainesville, FL

5 – 5:30 pm | Micromechanical Response of Polyacrylamide Surfaces Following Abrasive Wear

Shabnam Bonyadi, Michael Atten, Jiho Kim, Alison Dunn, University of Illinois at Urbana-Champaign, Urbana, IL

6E | Lubrication Fundamentals VI

1:30 – 2 pm | Investigation on the Tribochemical Reaction Mechanism of In Situ Carbon Tribofilm Formation from CPCa

Hongxing Wu, Blake Johnson, Xingliang He, Yip-Wah Chung, Qian Wang, Northwestern University, Evanston, IL

2 – 2:30 pm | Plasma Functionalized PTFE Nano-Additives for Lubricated Contacts

Pranesh Aswath, Vinay Sharma, Richard Timmons, University of Texas at Arlington, Arlington, TX, Ali Erdemir, Argonne National Laboratory, Argonne, IL

2:30 – 3 pm | Lubricant Additive Surface Interactions: Organic Polysulfides

Paul Shiller, Marisa Seeley, Emily Tully, Gary Doll, The University of Akron, Akron, OH

3 – 3:30 pm – Break

3:30 – 4 pm | Influence of ZDDP Degradation on Engine Oil Tribology – Understanding on Molecular Level

Nicole Doerr, Andjelka Ristic, Josef Brenner, Charlotte Besser, Marcella Frauscher, AC2T Research GmbH, Wiener Neustadt, Austria

4 – 4:30 pm | Adsorption of ZDDP and its Relationship to Anti-Wear Properties

Aditya Jaishankar, Jessica Vreeland, Shane Deighton, Andrew Konicek, Arben Jusufi, David Baillargeon, Alan Schilowitz, ExxonMobil Research and Engineering, Annandale, NJ

4:30 – 5 pm | Tribological Interaction of ZDDP and Plasma Functionalized TiO₂ Nanoparticles Under Boundary Lubrication

Vinay Sharma, Pranesh Aswath, Richard Timmons, University of Texas at Arlington, Arlington, TX, Ali Erdemir, Argonne National Laboratory, Argonne, IL

6F | Wear VI

Sessions Pending

6G | Environmentally Friendly Fluids II

Additives

1:30 – 2 pm | New Film-Forming Additives

Keihann Yavari, Olean, Compiègne Cedex, France

2 – 2:30 pm | Evaluation of Friction and Wear Behavior of Bio-Derived Performance Additives

M. Cinta Lorenzo Martin, Oyelayo Ajayi, Argonne National Laboratory, Lemont, IL, Selim Erhan, Archer Daniels Midland Company, Decatur, IL

2:30 – 3 pm | Development of New McIn™ Dual Function Corrosion and Rust Inhibitors for Environmentally Acceptable Lubricants (EAL)

Ashok Cholli, Polnox Corporation, Lowell, MA

3 – 3:30 pm – Break

3:30 – 4 pm | Comparative Study of Tribological Properties of Vegetable Oils Added with Pristine and Fluorinated Carbon Nanofibers as Additives in Mineral Oil

Nadiège Nomedé-Martyr, Yoan Debaud, Philippe Thomas, Laurence Romana, University of West Indies, Pointe à Pitre, Guadeloupe

4 – 4:30 pm | Sustainable Additives for Environmentally Friendly Lubricant Composition

Gobinda Karmakar, University of North Bengal, Siliguri, West Bengal, India

4:30 – 5 pm | Evaluation of Karanja Oil (Pongamia Pinnatta) as a Green Lubricant with Nano ZnO as EP Additive

Jayadas Haridas, Cochin University of Science and Technology, Kalamassery, Kerala, India

5 – 5:30 pm | Environmentally Friendly Fluids Business Meeting

6H | Contact Mechanics IV

1:30 – 2 pm | Effect of Lubrication on Rolling Contact Fatigue

Hamid Ghaednia, Auburn University, Auburn, AL, Matthew Brake, Iyabo Lawal, Rice University, Houston, TX

2 – 2:30 pm | Schallamach Waves in Rolling: Belt Drives

Michael Varenberg, Yingdan Wu, Michael Leamy, Georgia Institute of Technology, Atlanta, GA

2:30 – 3 pm | Simulative and Experimental Investigations on the Application of Artificial Indentations on the Raceway of Rolling Element Bearings

Jan Hendrik Kehl, Leibniz University Hannover, Hannover, Germany

3 – 3:30 pm – Break

3:30 – 4 pm | Three-Dimensional Elasto-Plastic Line Contact of Materials Containing Inhomogeneities

Linlin Sun, Leon M. Keer, Qian Wang, Northwestern University, Evanston, IL, Ning Zhao, Mengqi Zhang, Northwestern Polytechnical University, Xi'an, China, Wayne Chen, Schlumberger, Katy, TX, Peter Glaws, Phil Hegedus, Timken Steel, Canton, OH

4 – 4:30 pm | Influence of the Characteristics of Nitrided Micro - Structures on the Initiation of Surface Pits Under Rolling Contact Fatigue

Etienne Bossy, Univ Lyon, INSA-Lyon, LaMCoS, Villeurbanne, France, Jean-Philippe Noyel, Univ Lyon, ECAM-Lyon, INSA-Lyon, Lyon, France, Xavier Kleber, Univ

Lyon, INSA-Lyon, Mateis, Villeurbanne, France, Fabrice Ville, Univ Lyon, INSA-Lyon, LaMCoS, Villeurbanne, France, Christine Sidoroff, NTN-SNR, NTN Group, Annecy, France, Simon Thibault, Safran Tech, Safran Group, Magny-les-Hameaux, France

4:30 – 5 pm | Proposal for a Damage Model for Solids Under Fretting Contact Conditions

Thibault Beyer, Thibaut Chaise, Daniel Nelias, INSA-Lyon, Villeurbanne, France, Julien Leroux, Safran Aircraft Engines, Moissy Cramayel, France

5 – 5:30 pm | Multigrid Solution of 2D and 3D Stress Fields in Contact Mechanics of Anisotropic Inhomogeneous Materials

Binbin Zhang, Cornelis Venner, University of Twente, Enschede, Netherlands, Hugo Boffy, Engineering and Research Centre, SKF, Nieuwegein, Netherlands

5:30 – 6 pm | An Elasto-Plastic Finite Element Study of Displacement-Controlled Fretting in a Plane-Strain Cylindrical Contact

Huaidong Yang, Itzhak Green, Georgia Institute of Technology, Atlanta, GA

6I | Surface Engineering IV

1:30 – 2 pm | Yield Modes in a Coated Sphere Compressed by a Rigid Flat

Zhou Chen, Roman Goltsberg, Izhak Etsion, Technion, Haifa, Israel

2 – 2:30 pm | High-Throughput Dispersion Strengthening of Metallic Surfaces at Room Temperature

Xingliang He, Yao Du, Yi Shi, Kornel Ehmann, Yip-Wah Chung, Qian Wang, Northwestern University, Evanston, IL

2:30 – 3 pm | The Effects of Laser Surface Texturing on Friction and Wear Properties of 45 Steel

Xianjuan Pang, Henan University of Science and Technology, Luoyang, Henan Province, China

3 – 3:30 pm – Break

6J | Engine & Drivetrain VI

1:30 – 2 pm | Tribology in Hot Steam for Energy Recovery

Mathias Woydt, BAM, Berlin, Germany

2 – 2:30 pm | New Landfill Gas Engine Oil for Durability and Cost Optimization

Jamal Kassir, Nazmul Hossain, Idemitsu Lubricants America Corporation, Southfield, MI, Yoshiharu Tatematsu, Idemitsu Kosan Co., Ltd., Tokyo, Japan

2:30 – 3 pm | Lubricant and Material Aspects of Helicopter Transmission Loss-of-Lubrication

Stephen Berkebile, Kevin Radil, Brian Dykas, US Army Research Laboratory, Aberdeen Proving Ground, MD, Radames Colon-Rivera, NAVAIR, Patuxent River, MD, Jason Fetty, Army Aviation Development Directorate, Ft. Eustis, VA

3 – 3:30 pm – Break

3:30 – 4 pm | Progress Towards a DD13 Scuffing Screener Test

Carlos Sanchez, Peter Lee, Southwest Research Institute, San Antonio, TX

4 – 4:30 pm | Top Treating Locomotive Engine Oils with Novel Oil Soluble Polyethers

Ashwin Bharadwaj, John Cuthbert, Ashish Kotnis, Dow, Lake Jackson, TX

4:30 – 5 pm | ROBO as a Formulation Tool for Engine Oil Development

Brian Hess, Joan Souchik, Justin Mills, Evonik Oil Additives, Horsham, PA

5 – 5:30 pm | Engine Oil Aeration: Lab Simulation and Correlation to Engine Testing

Ricardo Hein, Conexo, Inc., Acworth, GA

6K | Rolling Element Bearings VI

1:30 – 2 pm | A Coupled Eulerian-Lagrangian Model For More Realistic Simulations of Debris Denting in Rolling Element Bearings

Alexis Bonetto, Daniel Nelias, Thibaut Chaise, INSA-Lyon, Villeurbanne, France, Laurent Zamponi, Airbus, Marignane, France

Wednesday, May 23

2 – 2:30 pm | Effects of the Grease on the Failure of a Main Bearing
Arturo Cardenas, Gigatec, San Luis Potosi, SLP, Mexico

2:30 – 3 pm | Changing Bearing Load Profile of HVAC Screw Compressors
Kevin Hughes, Trane Commercial HVAC, La Crosse, WI

3 – 3:30 pm – Break

6L | Rolling Element Bearings VII

Roundtable Discussion

3:30 – 6 pm | Scientific Brainstorming & Networking Event
Hannes Grillenberger, Schaeffler Technologies AG & Co. KG, Herzogenaurach, Germany

6M | Tribotesting I

1:30 – 2 pm | Vibration and its Role in the Delay of Catastrophic Adhesive Failure in the Twist Compression Test

Gregory Dalton, College of the North Atlantic, St John's, Newfoundland, Canada, Ted McClure, SLC Testing Services Inc./Sea-Land Chemical Company, Westlake, OH

2 – 2:30 pm | On the Use of Acoustic Emission as a Laboratory Tool for Investigating Mixed-Elastohydro-dynamic Contacts

Alastair Clarke, Simon Hutt, H.P. Evans, Cardiff University, Cardiff, United Kingdom

2:30 – 3 pm | Surface-Modified Hal Nanotubes as Fillers Applied in Reinforcing Performance of PTFE
Zhilin Cheng, Yangzhou University, Yangzhou, China

3 – 3:30 pm – Break

3:30 – 4 pm | Comparing Gas-Phase Synthesized Graphene to Graphene Platelets for Effectiveness as a Lubricant Additive in Bio-Derived Oil and PAO

Gordon Krauss, Albert Dato, Harvey Mudd College, Claremont, CA, Matthew Siniawski, Loyola Marymount University, Los Angeles, CA

4 – 4:30 pm | Direct Observations of Nanotribology in Crumpled Layered Materials

Alex Lin, Xiao-xiang Yu, Laurence Marks, Northwestern University, Evanston, IL, Albert Dato, Gordon Krauss, Harvey Mudd College, Claremont, CA

4:30 – 5 pm | Monitoring the Growth of a Nanoparticle-Activated Tribofilm through Electrical Conductivity

Hong Liang, Wei Dai, Texas A&M University, College Station, TX

5 – 5:30 pm | Testing of Wear and Erosion Effects of Nanofluids on Metals: New Instruments and Assessment Methodologies

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

5:30 – 6 pm | Tribotesting Business Meeting

6N | Gears I

3:30 – 4 pm | Statistical Distribution of Gear Surface Fatigue Lives Using the Three-Parameter Weibull Distribution

Timothy Krantz, NASA, Cleveland, OH, Zachary Cameron, Pennsylvania State University, State College, PA

4 – 4:30 pm | Hypoid Gear Run-In Polishing Oil Formulation and Testing for Efficiency (Part I)

Lavern Wedeven, William Black, Steven Kratz, Graham Wedeven, Robert Homan, Eric Van Kooten, Wedeven Associates, Inc., Edgmont, PA, Nelson Forster, Herbert Chin, Wedeven Associates Inc., Centerville, OH, Stephen Berkebile, US Army Research Laboratory, Aberdeen Proving Ground, MD

4:30 – 5 pm | Hypoid Gear Run-In Polishing Oil Formulation Axle Testing for Efficiency (Part II)

Lavern Wedeven, Steven Kratz, Wedeven Associates, Inc., Edgmont, PA, Allen Comfort, Adam Brandt, US Army Tardec, Warren, MI

5 – 5:30 pm | Investigation on the Effect of Lubricant in a Gear Test Without Running-In

Sho Yokoyama, Idemitsu Kosan Co., Ltd., Ichihara-shi, Chiba, Japan

Thursday, May 24, 2018

7A | Nanotribology V

Nanoparticle Enhanced Lubrication I

8 – 8:30 am | Macroscale Tribological Experiments Using Oils Containing ZrO₂ Nanocrystals

Nicholaos Demas, Aaron Greco, Ben Gould, Robert Erck, Argonne National Laboratory, Lemont, IL

8:30 – 9 am | In Situ Tribofilm Growth Study of Zirconia Nanoparticle Antiwear Additive

Allen Comfort, Steven Thrush, US Army Tardec, Warren, MI

9 – 9:30 am | In Situ AFM Formation and Characterization of Tribofilms From Zirconia Nanoparticle Anti-Wear Additives: Growth Mechanisms and Interactions With Co-Additives

Robert Carpick, Harman Khare, I. Lahouij, Andrew Jackson, University of Pennsylvania, Philadelphia, PA, Gregory Cooper, Pixelligent LLC, Baltimore, MD

9:30 – 10 am | Organic-Modified Palladium and Silver Nanoparticles as Oil Additives for Friction and Wear Reduction

Chanaka Kumara, Donovan Leonard, Harry Meyer, Huimin Luo, Jun Qu, Oak Ridge National Laboratory, Oak Ridge, TN

10 – 10:30 pm – Break

10:30 – 11 am | A Combined QCM and AFM Study Exploring Nano-Scale Lubrication Mechanisms and Electrokinetic Effects in Aqueous Suspensions of Silica and Diamond Nanoparticles

Jacqueline Krim, Colin Curtis, Biplav Acharya, Melanie Chestnut, Antonin Marek, Alex Smirnov, North Carolina State University, Raleigh, NC

11 – 11:30 am | Mechanical Characterization of Diesel Soot Nanoparticles: In Situ Compression in the Transmission Electron Microscope and Simulations

Fabrice Dassenoy, Istvan Jenei, Ecole Centrale de Lyon, Ecully, France, Arash Khajeh, Ashlie Martini, University of California, Merced, Merced, CA, Thierry Epicier, INSA, Lyon, France, Dairene Uy, Hamed Ghaednia, Arup Gangopadhyay, Ford Motor Company, Novi, MI

11:30 am – Noon | Fatigue Property Study of Al/a-Si Core-Shell Nanostructures by Cyclic Nanoindentation

Jason Steck, Robert Fleming, Josue Goss, Min Zou, University of Arkansas, Fayetteville, AR

7B | Wind Turbine Tribology I

8 – 8:30 am | Compact Filter Debris Analysis for Wind Turbine Gearbox Condition Monitoring

Shuangwen Sheng, National Renewable Energy Laboratory, Golden, CO, Don Roberts, D.A. Roberts, LLC, Seattle, WA

8:30 – 9 am | Understanding the Criticality of Gear Oil Cleanliness Requirements

Caitlin Mertzluft, Kurt Bakan, NextEra Energy, North Palm Beach, FL

9 – 9:30 am | Polyalkylene Glycol-Based Wind Turbine Gear Oil Designed for Long Life and High Energy Efficiency

Daniel Zweifel, Dow Europe GmbH, Horgen, Zürich, Switzerland, Jan Ukonsaari, Vattenfall AB, Luleå, Sweden

9:30 – 10 am | Cost-Effective Management of Wind Turbine Lubricants

Matthew Snow, Invenenergy LLC, Chicago, IL

10 – 10:30 pm – Break

10:30 – 11 am | New Wind Turbine Bearing Grease Technology

Kristina Goermer, Jonathan Leather, David DiNunzio, Castrol, Holden, MA

11 – 11:30 am | Grease Selection for Mainshaft Bearing in the Wind Turbines

Kuldeep Mistry, Carl Hager, Douglas Lucas, Gerald Richter, The Timken Company, North Canton, OH

11:30 am – Noon | Blade Bearings in Wind Turbines – False Brinelling and Fretting Corrosion

Fabian Schwack, Gerhard Poll, Institute of Machine Design and Tribology, Hannover, Germany, Matthias Stammer, Fraunhofer Institute, Hannover, Lower Saxony, Germany

7C | Non-Ferrous Metals I

8 – 8:30 am | A Novel Method for Evaluation of Galling during Piercing Punching of Sheet Aluminum Alloys

Muhammad Zafar Khan, Sukanta Bhowmick, Ahmet Alpas, University of Windsor, Windsor, Ontario, Canada, Mehdi Shafiei, John Hunter, Novelis Global Research & Technology Center, Kennesaw, GA

8:30 – 9 am | Topographical Characteristics of Twin Roll Cast Aluminum Strip Surface and Its Evolution With Rolling

Murat Dunder, Assan Aluminum, Istanbul, Turkey

9 – 9:30 am | Low Stain Lubricants for Aluminum Rolling Mills

Alois Joassard, Total, Nanterre, France

9:30 – 10 am | Environmental Regulations and How They Effect Lubricant Selection

Andrea Knopp, Lightstone Generation – Gavin Power LLC, Ravenswood, WV

10 – 10:30 pm – Break

10:30 – 11 am | Laboratory Bliss Mill Study of Traditional Versus Low Fatty Acid Chemistry

Thomas Oleksiak, Novelis, Inc., Kennesaw, GA

11 – 11:30 am | Chemical-Physical Characterization of Contaminants (Leaks) in Aluminum Hot Mill Emulsions

Jose Castillo, Aleris Corporation, Superior, CO, David Borden, Rose-Hulman Institute of Technology, Terre Haute, IN

11:30 am – Noon | Nuclear Magnetic Resonance Spectroscopy as a Useful Tool for the Analysis of Emulsions

Josef Leimhofer, AMAG Rolling GmbH, Ranshofen, Austria

7D | Materials Tribology V

Advanced Metals and Ceramics

8 – 8:30 am | Friction and Wear of Metals with Unconventional Microstructures

Tomas Babuska, Richard Vinci, Brandon Krick, Lehigh University, Bethlehem, PA, John Curry, Andrew Kustas, Michael Chandros, Nicolas Argibay, Sandia National Laboratories, Albuquerque, NM

8:30 – 9 am | The Origin of Microstructural Changes Underneath a Tribologically Loaded Surface

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

9 – 9:30 am | Electrical Energy Consumption and Tribological Performance of Selective-Laser-Melting-Produced Samples Using Various Processing Parameters

Yi Zhu, Zhejiang University, Hangzhou, China

9:30 – 10 am | Friction Characteristics of Cobalt-Free Alloy under Flat-on-Flat Sliding Simulating Nuclear Gate Valve Applications

Terry Merriman, Tribology Associates, Columbus, OH, David Gandy, EPRI, Charlotte, NC

10 – 10:30 pm – Break

10:30 – 11 am | Tribodoping on III-Nitrides

Guosong Zeng, Zeyuan Tian, Wei Sun, Nelson Tansu, Brandon Krick, Lehigh University, Bethlehem, PA, Xiaofang Yang, Bruce Koel, Princeton University, Princeton, NJ

11 – 11:30 am | Wear Behavior of ODS Copper Alloy Contact Materials Under Different Currents

Xiuhua Guo, Kexing Song, Yanjun Zhou, Yanmin Zhang, Xu Wang, Henan University of Science and Technology, Luoyang, China

11:30 am – Noon | Investigating Grid-to-Rod Fretting Wear of Nuclear Fuel Claddings Using a Unique Autoclave Fretting Rig

Jun Qu, Sladjan Lazarevic, Harry Meyer, Oak Ridge National Laboratory, Oak Ridge, TN, George Plint, Cyrille Favede, Phoenix Tribology Ltd., Hampshire, United Kingdom, Roger Lu, Westinghouse Electric Company, Hopkins, SC, Peter Blau, Blau Tribology Consulting, Enka, NC

7E | Lubrication Fundamentals VII

Sessions Pending

7F | Gears II

8 – 8:30 am | Ionic Liquids as Novel Additives for Rear Axle Fluids

Jun Qu, Benjamin Stump, Yan Zhou, Huimin Luo, Donovan Leonard, Oak Ridge National Laboratory, Oak Ridge, TN, Michael Viola, Hai Xu, General Motors, Warren, MI, Randy Parten, Oak Ridge National Laboratory, Oak Ridge, TN

8:30 – 9 am | Influence of a New High Viscosity Basestock on Gear Performance

Nawid Kashani, Karolin Geyer, Frank Rittig, Jochen Wagner, Kian Molawi, BASF SE, Ludwigshafen, Rhineland-Palattonia, Germany, Gene Zehler, Philip Ma, BASF Corp., Tarrytown, NY

9 – 9:30 am | Effect of Retained Austenite on Micropitting Behavior of Carburized AISI 8620 Steel Under Boundary Lubrication Condition

Sougata Roy, Sriram Sundararajan, Iowa State University, Ames, IA

9:30 – 10 am | Benchmark Gear Micropitting Wear Prediction with Transmission Testing

Weixue Tian, Hyung Yoon, Tim Nusz, Caterpillar Inc., Peoria, IL

10 – 10:30 pm – Break

10:30 – 11 am | Micropitting Damage in Gear Teeth Contacts: Influencing Factors and Mechanisms of Their Action

Amir Kadiric, Pawel Rycerz, Benjamin Wainwright, Imperial College London, London, United Kingdom

11 – 11:30 am | The Influence of Micropitting on the Friction Coefficient of Two Lubricated Surfaces – An Experimental Investigation

Thomas Touret, Christophe Changenet, LaMCoS-ECAM, Lyon, Rhone, France, Fabrice Ville, LaMCoS, Villeurbanne, France, Majid Lalimi, Samuel Becquerelle, Safran Transmission Systems, Colombes, France

11:30 am – Noon | Influence of Low Circumferential Speeds on the Lubrication Conditions and the Damage Characteristics of Case-Hardened Gears

Johannes Koenig, Thomas Tobie, Karsten Stahl, Technical University of Munich (TUM), Garching b. Muenchen, Germany, Michael Felbermaier, Dr. Ing. h.c. F. Porsche AG, Weissach, Germany

7G | Environmentally Friendly Fluids III

Finished Lubricants

8 – 8:30 am | Ecolabel 2018 and VGP2018 – Changes and Challenges

Paula Vettel, Novvi LLC, Emeryville, CA

8:30 – 9 am | New Findings on Test Methods for Testing Biodegradability of Lubricants

Peter Lohmann, Gerhard Gaule, Ben Mueller-Zermini, Hermann Bantleon GmbH, Ulm, Germany

9 – 9:30 am | Product-Specific Requirements (PSR) for Hydraulic Fluids – A New Approach to User-Centric Product Stewardship

Christina Bocher, DEKRA Assurance Services GmbH, Stuttgart, Bad.-Württ., Germany, Ivo Mersiowsky, Quiridium, Tübingen, Bad-Wurt, Germany

9:30 – 10 am – Break

10 – 10:30 am | Soy-Based Lubricants: Performance and Sustainability

Robert Brentin, Omni Tech International, Midland, MI

10:30 – 11 am | Comparison of a New Commercial Grease with Other Commercial Greases Certified as Environmentally Acceptable Lubricants

Doug Adams, RSC Bio Solutions, Indian Trail, NC

11 – 11:30 am | The Compatibility of Multilayer Surface Treatments with Bio-Lubricants Base Oils

Julia Carrell, Tom Slatter, Roger Lewis, The University of Sheffield, Sheffield, South Yorkshire, United Kingdom

11:30 am – Noon | Testing of Wet Clutch Materials in Mineral and Biobased Fluids

Steve Shaffer, Bruker, San Jose, CA, Paul Luebbers, Alto Products Corp., Atmore, AL, Larry Beaver, RSC Chemical Solutions, Indian Trail, NC

7K | Tribotesting II

8 – 8:30 am | High Throughput Tribometry

Brendan Nation, John Curry, Michael Dugger, Sandia National Laboratories, Albuquerque, NM

8:30 – 9 am | Development of a More Rational Scuffing Test Protocol for Use in a Reciprocating Tribometer

George Plint, Phoenix Tribology Ltd., Kingsclere, Select, United Kingdom

9 – 9:30 am | Characterization of Tribochemical Surface Films From In-Use Engine Components

M. Cinta Lorenzo Martin, Oyelayo Ajayi, Argonne National Laboratory, Lemont, IL, Raul Arenal, INA- Universidad de Zaragoza, Zaragoza, Spain

9:30 – 10 am | Improving Fuel Lubricity Sensitivity Using High Frequency Reciprocating Line Contact

Gregory Hansen, Peter Lee, Southwest Research Institute, San Antonio, TX

10 – 10:30 am – Break

10:30 – 11 am | Introducing a New Benchtop Technique to Measure the Behavior of Brake Materials: Correlation with Dynamometer Tests

Giovanni Ramirez, Steve Shaffer, Kora Farokhzadeh, Ivo Miller, Bruker Nano Surfaces, San Jose, CA, Peter Filip, Southern Illinois University, Carbondale, IL, Charles Greening, Greening Testing Laboratories, Detroit, MI

11 – 11:30 am | Friction Durability in Clutch Materials

Jason Laguna, Croda, New Castle, DE

11:30 am – Noon | A New Method for High-Speed Ball-on-Disc Test

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

7N | Engine & Drivetrain VII

Special Session

8 – 8:30 am | Understanding Total Base Number Measurement

Anil Agiral, David Zalatan, Paul Sutor, Chevron Oronite, Richmond, CA

8:30 – 9 am | Texturing on Engine Components Using Low Cost Soft Mask Technology

Govindaiah Patakamuri, Stephen Hsu, The George Washington University, Washington, DC, Tim Cushing, GMC LLC, Warren, MI

9 – 9:30 am | Modelling of the Tribological Performance of Piston Ring-Cylinder Liner Tribo-System of Low Speed 2-Stroke Diesel Engine

Xiuyi Lv, Xiqun Lu, Tongyang Li, Qingbing Dong, Bin Zhao, Harbin Engineering University, Harbin, Heilongjiang, China

9:30 – 10 am | Engine Oil Turbocharger Deposit Performance in Various Turbocharger Protection Tests

Kongsheng Yang, William Lam, Kristin Fletcher, Gregory Guinther, Afton Chemical Corporation, Richmond, VA

8A | Nanotribology VI

Nanoparticle Enhanced Lubrication II

1:30 – 2 pm | Stable Dispersion and Tribological Performance of IF-WS₂ Nanoparticles in Aqueous System

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

2 – 2:30 pm | Nanoparticle Enhanced Lubricants: Potential Use in Metalworking Fluids

Shilpa Beesabathuni, Yan Zhou, Yixing Zhao, Houghton International, Valley Forge, PA

2:30 – 3 pm | The Effect of Graphene Nanoplatelet Addition to the Tribological Performance of Powertrain Lubricants

Steven Thrush, Allen Comfort, US Army Tardec, Warren, MI

3 – 3:30 pm – Break

8B | Wind Turbine Tribology II

1:30 – 2 pm | The Influence of Material Properties and Steel Cleanliness on the Formation of White Etching Cracks

Benjamin Gould, Aaron Greco, Nicholas Demas, Argonne National Laboratory, Argonne, IL

2 – 2:30 pm | A Study on the Influence of Electrical Current on the Formation of White Etching Cracks and its Monitoring Using Electrostatic Sensors

Kamran Esmaeili, Ling Wang, Terry Harvey, Neil White, University of Southampton, Southampton, United Kingdom, Walter Holweger, Schaeffler Technologies GmbH & Co. KG, Herzogenaurach, United Kingdom

2:30 – 3 pm | Microstructural Characterization of Dark and White Etching Features

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

3 – 3:30 pm – Break

3:30 – 4 pm | Presence of White Etching Matter Along Cracks in Bearings

R. Scott Hyde, Mohanchand Paladugu, The Timken Company, North Canton, OH

8C | Non-Ferrous Metals II

1:30 – 2 pm | Emulsifiers: Next Generation of Low Foam Multifunctional Additives

Andy Michael, Clariant Corporation, Mt. Holly, NC

2 – 2:30 pm | Tribological Investigation of Polyphosphonated Vegetable Oils and Esters

Girma Biresaw, Grigor Bantchev, USDA-ARS-NCAUR, Peoria, IL

2:30 – 3 pm | Correlations Between the Average Molecular Weight and Viscosity of Soybean Polymercaptan

Grigor Bantchev, Karl Vermillion, James Lansing, Girma Biresaw, USDA-ARS-NCAUR, Peoria, IL

3 – 3:30 pm – Break

3:30 – 4 pm | Non-Ferrous Scuffing Wear Properties of Biobased and Renewable Lubricants in Mixed Lubrication Regime

Jason Galary, Nye Lubricants, Inc., Fairhaven, MA

4 – 4:30 pm | New Biolubricants From Products of Synthetic Biology

Basil Nikolau, Iowa State University, Ames, IA

4:30 – 5 pm | Bio-Generation of Succinic Acid by Fermentation of Physaria Fendleri Press Cake

Rogers Harry-O'kuru, USDA-ARS-NCAUR, Peoria, IL

8D | Materials Tribology VI

Advanced Metals and Ceramics

1:30 – 2 pm | Synthesis and Characterization of Novel MAX Reinforced Ceramics (MAXCERs)

Johnny Nelson, Surojit Gupta, University of North Dakota, Grand Forks, ND

2 – 2:30 pm | Spherical Abrasives: Ductile Mode Material Removal for Brittle Materials

Arkadeep Kumar, Shreyes Melkote, Georgia Institute of Technology, Atlanta, GA, Rebecca Ashley, University of Central Florida, Orlando, FL, Andrii Kovalechenko, Evgeniy Pashchenko, Institute for Problems of Materials Science, Kyiv, Ukraine

2:30 – 3 pm | Crystal Structure of the Interface Formed by Thermosonic Bonding and Its Effect

Kenji Matsumoto, Yuki Ono, Honda R&D Co., Ltd., Hagan, Tochigi, Japan, Akira Sasaki, Maintek Consultant, Yokohama, Kanagawa, Japan, Yuji Mihara, Tokyo City University, Setagaya, Tokyo, Japan

3 – 3:30 pm – Break

8E | Lubrication Fundamentals VIII

Sessions Pending

8F | Gears III

1:30 – 2 pm | Scuffing Resistance and Starved Lubrication Behavior in Helicopter Gear Steels: Nano - composite Surface Coatings Applied at Low Temperature

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

2 – 2:30 pm | Investigation into the Role of Oxygen on the Formation of Tribofilms of Gear Oil Additives Using X-Ray Absorption Near Edge Structure (XANES) Spectroscopy

Michael Costello, BASF, Tarrytown, NY

2:30 – 3 pm | Backlash and its Influence on Gear Failure During Loss-of-Lubrication Operation

Kevin Radil, US Army Research Lab, Cleveland, OH

3 – 3:30 pm – Break

3:30 – 4 pm | Loss-of-Lubrication Simulation of Spur Gears Using a CFD-Based Multi-Scale Technique and Gear Meshing Tribology Model

Sean McIntyre, Aaron Isaacson, Pennsylvania State University, State College, PA

4 – 4:30 pm | A Review of Probabilistic Mixed EHL and of Recent Research with Impact on Probabilistic EHL Models

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

8G | Environmentally Friendly Fluids IV

Sessions Pending

8K | Tribotesting III

1:30 – 2 pm | Effects of Base Oil on Tribofilm Formation and Friction

Timothy Cameron, Kun Qian, Zhijiang Ye, Miami University, Oxford, OH

2 – 2:30 pm | Influence of Electrically-Charged Polymer Surfaces on Lubricated Sliding Contact

Marian Neagoe, Yopa Eka Prawatya, Thami Zeghloul, Lucian Dascalescu, University of Poitiers, Angoulême, France

2:30 – 3 pm | Interactions Between Frictional Behavior and Tribocharging of Polymer Slabs

Yopa Eka Prawatya, Marian Neagoe, Thami Zeghloul, Lucian Dascalescu, University of Poitiers, Angoulême, France

3 – 3:30 pm – Break

3:30 – 4 pm | Testing the Practical Limits of Fluoropolymer-Alumina Composites

Cooper Atkinson, Mark Sidebottom, Tomas Babuska, Kyle Kirk, Kasey Campbell, Christopher Junk, Brandon Krick, Lehigh University, Bethlehem, PA, Heidi Burch, Greg Blackman, E.I du Pont de Nemours and Company Inc., Wilmington, DE

4 – 4:30 pm | Tribological Testing of Soft Interfaces – Food, Skin, and Cartilage

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

4:30 – 5 pm | Exploration of Key Parameters Involved in Relevant Tribological Testing of Implantable Cardiac Device Leads

Cris Schwartz, Mark Placette, Iowa State University, Ames, IA, Adam Himes, Medtronic, Mounds View, MN

5 – 5:30 pm | Experimental Investigation of Force Response, Efficiency, and Wear Behaviors in Polycrystalline Diamond Cutting of Rock for Air Drilling

Huaping Xiao, China University of Petroleum, Beijing, China



Share your STLE 2018 Annual Meeting Presentation With Submission of an Extended Abstract

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 23, 2018**, to ensure materials are available to attendees before the meeting.

Submissions must be in PDF format and can be emailed to Karl Phipps at presentations@stle.org.

For more information about requirements, please visit www.stle.org.

Education Courses

The 2018 STLE Annual Meeting & Exhibition features 12 industry-specific education courses offered on two days of the conference: Sunday, May 20, and Wednesday, May 23. The schedule is designed to give attendees more flexibility when planning their conference attendance. All courses are full day (start at 8 am and end at 5 pm).

STLE education courses are \$325 with a full meeting registration (except for the NLGI Grease 101 course which is \$615), \$530 for STLE members without a meeting registration and \$750 for a non-member with no meeting registration. (See page 10 for registration form). If you have questions regarding these courses, please contact Tom Heidrich, education manager at (847) 825-5536, theidrich@stle.org.

Sunday, May 20

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.

New! Advanced Tribology 310: Nanotribology

This course will begin with an introduction to the topic of Nanotribology. The course will then cover molecular dynamics, tribochemistry and nanomechanical characterization. The course day will conclude with a module covering nanoparticle additives.

Automobile Lubrication 202: Gasoline

This course will begin with an overview of Automotive Engines and Transmission Hardware. It will then cover Engine and Vehicle Bearings, Engine Oils, Automotive Transmission Fluids and Tribology Testing for Automotive Components. The course will then conclude with presentations on Surface Texture Measurement: Analysis for Automotive Applications and on the Future of Automotive Tribology.

Basic Lubrication 101: Fundamentals of Lubrication

Basic Lubrication 101 is primarily for the person entering the lubrication field who needs a broad introduction to the field of lubrication, lubrication principles and lubricating materials. This course is also for individuals not directly involved but who need a broad overview of lubricants and basic lubricating components. This course 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 101 is usually attended by a broad cross section of people such as technical, technical service, sales, marketing, manufacturing, maintenance and managers who in some way are involved in the industry.

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 125: Health & Safety

MWF 125 provides participants with an understanding of the fundamentals of the primary health and safety issues with which fluid managers, machine operators, shop stewards and managers must be familiar to provide workers with a safe work environment. The program opens with an overview of essential industrial hygiene and metalworking fluid toxicology concepts. It then teaches the fundamentals of mist generation in metalworking fluid systems; reinforcing these concepts with a case study. A case study is used to familiarize participants with metalworking fluid microbiology fundamentals. This fictionalized case study steps through microbiology basics, microbe health risks, and microbial contamination control. The final course module presents an overview of Global Harmonized Standards (GHS) and their impact on the metalworking fluid stakeholder community.

NLGI Grease 101 (Presented in cooperation with NLGI)

This course is a comprehensive overview of all aspects of lubricating grease. Grease formulation components are thoroughly covered, including base oils and the many different thickener types. Manufacturing technologies are reviewed, as well as grease testing significance and methods. Included is a good discussion detailing how to select the proper grease for different applications, and a variety of examples of both industrial and automotive applications are discussed.

Wednesday, May 23

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.

Basic Lubrication 102: Basic Applications

Basic Lubrication 102 is an overview of equipment systems (gears, bearings, seals, compressors and engines) and their lubrication requirements, including a module on grease. Like Basic Lubrication 101, this course does not require a formal

scientific degree or background, although many technical terms and concepts related to the use of lubricants in various mechanical devices are covered. This course is intended for a diverse group, including people involved in technical service, sales, marketing, manufacturing, maintenance and managers who want to know more about how lubricants work in service. This course assumes fundamental knowledge of lubricants and lubrication principles, as presented in the Basic Lubrication 101 course.

Condition Monitoring 101

Condition Monitoring 101 is a course for beginners or employees new to Condition Monitoring. Condition Monitoring 101 will cover fluid maintenance strategies, test methods and other best practices for Condition Monitoring.

Metalworking Fluids 105: Metal Forming Fluids

Metalworking Fluids 105 is designed for those involved in developing, working with and using metal forming fluids in the manufacturing environment. This course is very useful for formulators, technical service representatives, shop floor personnel and coolant service managers who need to know more about the fundamental concepts of metal forming fluids. This course is divided into modules covering metal forming operations, metal forming fluid chemistry, metal forming fluid failure mechanisms, controlling contamination and microbial growth, waste treatment and operator acceptance. By the end of the course, participants will have gained a good understanding of metal forming operations, formulation of metal forming fluids, tools for identifying and correcting metal forming fluid failures and waste treatment of metal forming fluids.

Synthetic Lubricants 204: Basestock Selection and Applications

Synthetic Lubricants 204 provides an introduction to synthetic lubricant basestocks and applications. The course will have presentations on Phosphate Esters, Food Processing Applications, Industrial Applications: Compressors, Transportation Applications, Gear Applications, Wind Turbine Applications and Synthetic Biolubricants.

Thursday, May 24

STLE Certification Exams

All four STLE technical certifications exams: Certified Lubrication Specialist™, Oil Monitoring Analyst I and II™ and Certified Metalworking Fluids Specialist™ will be conducted concurrently on Thursday, May 24, from 9 am to noon.

If you are interested in taking an exam during STLE's 2018 Annual Meeting & Exhibition, please contact Alicia Skulemowski at (847) 825-5536 or email certification@stle.org.

Exam Fees:

- First exam: \$405 (STLE member) • \$540 (Non-member)
- Retake exam: \$203 (STLE member) • \$270 (Non-member)

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

2018 Annual Meeting Education Course Chairs Committee



Ramoun Mourhatch – Chair
Chevron Oronite Co., LLC

Scott Howard – Vice Chair
Hy-Pro Filtration

Greg Croce – Past Chair
Chevron Products Co.

Dr. Vasu Bala
Tiarco Chemical

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Grease Technology Solutions, LLC

Daniel Holdmeyer
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Brian Hovik
Chemetall

Dr. Peter Lee
Southwest Research Institute

Dr. Babak Lotfizadehdehkordi

Kalyan Mutyala
Argonne National Laboratory

Dr. Frederick Passman
BCA, Inc.



Networking & Special Events

*Please note that all annual meeting events are at the **Minneapolis Convention Center** except for the Monday evening Networking Reception at the Hilton Minneapolis.

Student Networking Event

Sunday, May 20 • Ticket Required

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 2018 event will be held at Randle's Restaurant and Bar in downtown Minneapolis. For more information, contact Tom Heidrich at (847) 825-5536, theidrich@stle.org.



Tribology STEM Camp

Monday, May 21

During STLE's 2018 Annual Meeting, the society is hosting area high school students for its 6th 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 21 (Hilton Minneapolis)

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 20-24

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 22 • Ticket Required

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 2017-2018 President Mike Anderson with Falex Corp. and 2018-2019 President Greg Croce with Chevron. 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 2018 Networking Reception, Presidents Luncheon, Student Networking Event and Speakers Breakfast.

For more information, contact national sales manager Tracy Nicholas VanEe at (630) 922-3459, tnicholas@stle.org.



Tours

U.S. Bank Stadium

Sunday, May 20, 1 – 4 pm (Tentative)

Departure Location: Hilton Minneapolis

U.S. Bank Stadium is not just a location, but rather an epicenter of excitement, opportunity and Minnesota pride. This crown jewel is home of the Minnesota Vikings of the National Football League (NFL). Built on the former

site of the Hubert H.

Humphrey Metrodome,

the 66,000-seat indoor

stadium opened in 2016.

In its first year of

operation, the stadium

welcomed 1.6 million

visitors for over 600

public and private

events. In addition, U.S.

Bank Stadium will host

several major national

and international sports events, including Super Bowl LII (Feb. 4, 2018), the 2018 Summer X Games, the 2019 NCAA Men's Basketball Final Four, and the 2020 NCAA Division I Wrestling Championships.



© MEET MINNEAPOLIS

Price: \$49 per person • 30 person minimum*

*(Includes stadium/tour admission, metroConnections escort and transportation. **Subject to availability.**)*

Paisley Park

Sunday, May 20, 1:15 – 4:15 pm

Paisley Park provides fans worldwide with an unprecedented opportunity to experience first-hand what it was like for legendary musician Prince to create, produce and perform inside this private sanctuary and remarkable production complex. Throughout the

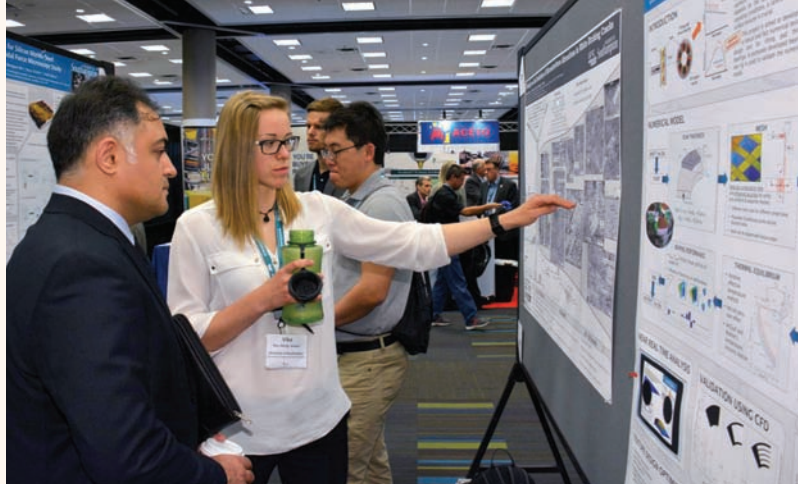
experience, visitors will see artifacts from Prince's personal archives, including iconic concert wardrobes, awards, musical instruments, artwork, motorcycles, rare music and video recordings. Prince was inducted into the Rock and Roll Hall of Fame in 2004, the first year of his eligibility. He was born in Minneapolis and resided in the area throughout his life.



© MEET MINNEAPOLIS

Price: \$85 per person • 35 person min./70 person max.* *(Includes general tour admission, metroConnections escort and transportation).*

***Note that STLE must guarantee a minimum number of tour participants, subject to cancellation if the minimum is not met.**



Call for Student Posters

STLE is seeking student posters at its 2018 Annual Meeting & Exhibition. Event organizers are inviting students from all areas of tribology research to participate in a special session dedicated to student posters. Posters must deal with an aspect of tribology research that can be translated into friction, wear and lubrication. Student poster research topics can be co-authored by faculty and other researchers, but only students may exhibit their posters and discuss their work at the session. The posters will be judged by a conference committee, and awards will be given to the best nine posters.

Submission criteria & information

- Abstract submission deadline: March 15, 2018 (via www.stle.org). Notification of acceptance will be sent to students shortly after this date.
- The poster must present original work by the student during the 2017-2018 academic year.
- The student may submit only one poster as the lead author.
- As the lead author of the poster, the student should have performed the major portion of the work.
- Lead authors must be full-time graduate or undergraduate students registered during the 2017-2018 academic year.
- Posters can be no larger than 48 x 48 inches.
- Posters must be set up Sunday afternoon or Monday morning. The author must be present at the poster display during the judging session on Monday, May 21, during lunch and the scheduled conference break that afternoon.

Award category (three winners in each category)

- **Platinum:** superior scientific and presentation quality (\$300 prize)
- **Gold:** good technical quality (\$200 prize)
- **Silver:** overall quality worthy to be encouraged (\$100 prize)

*Winners will be announced during the Presidents Luncheon on Tuesday, May 22.

For additional questions about the student poster session, please contact Merle Hedland at (630) 428-2133 or email mhedland@stle.org.

Opening General Session

Keynote Speaker



Dr. Robert W. Ivester
Director, Advanced
Manufacturing Office
(AMO), U.S. Department
of Energy

Monday, May 21
10:30 am – Noon | Minneapolis
Convention Center

Dr. Robert W. Ivester currently serves as the Director of the Advanced Manufacturing Office (AMO) in the Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy. AMO is focused on creating a fertile innovation environment for advanced manufacturing, enabling vigorous domestic development of new energy-efficient manufacturing processes and materials technologies to reduce the energy intensity and life-cycle energy consumption of manufactured products.



Prior to this position, Ivester served as the AMO Deputy Director for five years. During that time, AMO launched five Manufacturing USA Institutes, the Critical Materials Hub, and hundreds of smaller R&D and technical assistance projects across the nation. He also worked at the National Institute of Standards and Technology for over 16 years, leading and performing research in advanced manufacturing.

Since 2001, Ivester has been an instructor for the Johns Hopkins University Engineering for Professionals program for graduate-level studies in manufacturing engineering. He is a Fellow of the Society of Manufacturing Engineers (SME) and American Society of Mechanical Engineers (ASME) and received his doctorate in engineering, master of science in manufacturing engineering and bachelor of science in mechanical engineering from the University of Massachusetts at Amherst.

TOP 10 REASONS TO ATTEND #STLE2018

1. Connect With Your Peers

Join 1,600 industry professionals from around the world in the field of tribology research and lubrication engineering all gathered together in one location.

2. Learn About New Technologies

Explore the industry's latest products & services at the 150-exhibitor trade show and the popular Commercial Marketing Forum sessions.

3. Expand Your Technical Knowledge

Choose from some 500 presentations, application-based case studies, best practice reports and discussion panels on technical and market trends.

4. Talk To Industry Experts

There are plenty of networking opportunities at STLE's Annual Meeting to exchange ideas and information with colleagues that will help solve the kinds of real-world lubrication problems you encounter every day on your job.

5. Further Your Career Development

Invest in professional training opportunities by choosing from 12 industry-specific education courses taught by the top lubrication experts or attain one of STLE's four technical certifications.

6. Low-Cost Registration

Save \$100 by registering before the Early Bird deadline to receive your discount.

7. Meet Tribology's Future Leaders

Students and young professionals are encouraged to attend STLE's Annual Meeting to earn professional recognition and network with potential employers.

8. Network With Key Decision Makers

As the industry's premier technical event, STLE's Annual Meeting is the place for companies and suppliers to meet with the leading innovators that are looking to do business with you.

9. Be More Valuable To Your Company

Make sense out of an increasingly complex lubricants industry by learning new ideas, strategies and processes that will help improve your company's bottom line.

10. ALIGN WITH THE INDUSTRY'S BEST!





STLE 2018 Exhibition/Sponsorship Opportunities

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 Minneapolis. 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.

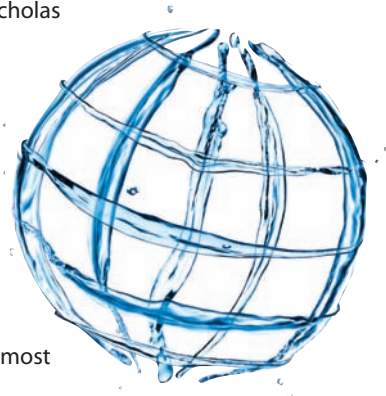
***Booths are 10 x 10 feet and are \$2,475 for STLE Corporate Members and \$2,875 for non-members.**

Exhibitor Appreciation Hour

Back by popular demand, two hours of dedicated exhibit time will occur at this year's show:

Monday, May 21 and Tuesday, May 22 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.



STLE's exhibition features companies from the following product categories:

- Lubricant additives
- Condition monitoring equipment
- Testing and analysis equipment, supplies and services
- Publications & journals
- Synthetic lubricants
- Lubrication management services
- Metalworking fluids and additives
- Environmental services
- Consulting services
- Industrial fluids



Commercial Marketing Forum

The Commercial Marketing Forum (CMF) is a series of 30-minute marketing sessions at STLE's 2018 Annual Meeting where you may promote your company's products and services, something not allowed in the technical sessions. Your CMF session is promoted in the Annual Meeting Program Guide, directing attendees to your presentation. CMF timeslots are sold on a "first-come, first-serve" basis.

Commercial Marketing Forum Pricing:

- \$560 for STLE Corporate Members who exhibit
- \$700 for STLE Corporate Members
- \$840 for individual members
- \$920 for non-members

Sponsorships come in all shapes, sizes and prices and are designed to fit everyone's marketing budget. To reserve a sponsorship or timeslot in the CMF sessions at the 2018 STLE Annual Meeting & Exhibition, contact national sales manager Tracy Nicholas VanEe at (630) 922-3459, tnicholas@stle.org.



STLE 2018 Exhibition • *Minneapolis Convention Center*

Annual Meeting Sponsorships

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:

- Badge Lanyards
- Education Course Materials
- Speakers Breakfast Series
- Registration Bags
- Networking Reception (Monday evening)
- Presidents Luncheon (Tuesday afternoon)
- Annual Meeting Mobile App
- Recharging Lounge
- Water Bottle Welcome Gift
- Refreshment Breaks Plus Water Stations
- Exhibitor Appreciation Hour Raffle
- Student Activities Sponsorships

New! Exciting, High-Impact Branding Opportunities for 2018 Sponsors!

Video Wall

Escalator Clings

Glass Panel Railings

Exhibition Hours | Minneapolis Convention Center | Minneapolis, Minnesota

Monday, May 21
Noon – 5 pm

Dedicated hour of trade show time from 3-4 pm. No other annual meeting activity during this time.

Tuesday, May 22
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 23
9:30 am – Noon

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.

Jaime Etheridge

Afton Chemical Corp.

Robert Gordon

Tannas Co.

Kayli Goss

The Dow Chemical Co.

Karen Grunwald

King Industries, Inc.

Kathleen Humiston

Cannon Instrument Co.

Bryan Huston

Acme-Hardesty Co.

Matt Mapus

Sea-Land Chemical Co.

Yama Olumi

Evonik Oil Additives, USA

Leanne Trevelline

LANXESS Corp.

Craig Tungate

Advanced Chemical Co.

Kenny Potter

Pilot Chemical Co.



Come view the newest products and services from the lubricant industry's leading companies. **More than 150 exhibitors will be in Minneapolis looking to do business with you!**

Minneapolis Convention Center

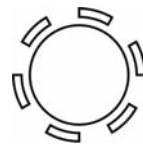
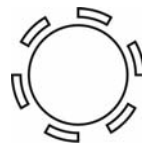
1301 2nd Ave S, Minneapolis, MN 55403

2018 Trade Show Floor Plan

Exhibition Dates: May 21-23, 2018



Exhibitor Lounge



631	630	531	530	431	430	331	330	231	230	131	130
629	628	529	528	429	428	329	328	229	228	129	128
627	626	527	526	427	426	327	326	227	226	127	126
625											124
623	622	523	522	423	422	323	322	223	222	123	122
621	620	521	520	421	420	321	320	221	220	121	120
619	618	519	518	419	418	319	318	219	218	119	118
617	616	517	516	417	416	317	316	217	216	117	116
615	614	515	514	415	414	315	314	215	214	115	114
613	612	513	512	413	412	313	312	213	212	113	112
611	610	511	510	411	410	311	310	211		111	110
609	608	509	508	409	408	309	308	209	208	109	108
607											106
605	503		403		303		203		103		104
603											102

2018 Annual Meeting Exhibitors

More than 100 organizations are expected to display their newest products and services at the 2018 STLE Annual Meeting & Exhibition. Following is the list of exhibitors as of Dec. 5, 2017. Visit www.stle.org and see the Program Guide distributed on site in Minneapolis for the most up-to-date list.



ABITEC Corp.	King Industries, Inc.
Acme-Hardesty Co.	Koehler Instrument Co., Inc.
Adeka Corp.	LANXESS Corp.
Advonex International	Lazar Scientific Inc.
Afton Chemical Corp.	Münzing
American Refining Group, Inc.	Nanjing Chemical Material Corp.
ANGUS Chemical Co.	Napoleon Engineering Services
Anton Paar USA	Nexeo Solutions
Ayalytical Instruments	Oil Filtration Systems (A Clark-Reliance Co.)
Beckman Coulter	PCAS
Bruker	PCC-Chemax, Inc.
BYK USA Inc.	PerkinElmer
Calumet Specialty Products Partners, L.P.	Phoenix Tribology Ltd.
Cannon Instrument Co.	PolyOne Corp.
Colonial Chemical Inc.	Rtec-Instruments, Inc.
Compass Instruments/Falex Corp.	Sasol Performance Chemicals
Croda Inc.	Savant Labs
Ducom Instruments	Sea-Land Chemical Co.
Elè Corp.	Solvay
Emery Oleochemicals	SONGWON Industrial Group
Evonik Oil Additives USA, Inc.	Spectro Scientific
FedChem, LLC	Tannas Co.
Focus Chemical	Temix Oleo
Functional Products, Inc.	The Dow Chemical Co.
GEO Specialty Chemicals	The Lubrizol Corp.
Hangzhou Sungate Trading Co., Ltd.	UE Systems Inc.
Industrial Quimica Lasem	Univar
INEOS Oligomers USA	Vanderbilt Chemicals, LLC
Ingevity	Vertellus Specialties Inc.
Kao Chemicals GmbH	Zschimmer & Schwarz
KH Neochem Americas, Inc.	Zygo Corp.



Society of Tribologists and Lubrication Engineers

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