



78th STLE Annual Meeting & Exhibition

Minneapolis Convention Center • Minneapolis, Minnesota (USA)

May 19-23, 2024

Program Guide & Schedule

- **Technical Sessions**
- **Exhibitors**
- **Education Courses**
- **Commercial Marketing Forum**
- **Student Poster Competition**
- **Keynote Address: "Tribology in the New Space Economy"**
- **Special Events**
- **Networking Opportunities**



Society of Tribologists and Lubrication Engineers • stle.org/annualmeeting

#STLE2024





HYDRAULIC MICROBOTZ™

HEROES OF PROTECTION AND PERFORMANCE

HITEC® 544

PERFORMANCE | EFFICIENCY | REASSURANCE

IN THE FIGHT TO COMBAT THE MOST SEVERE OPERATING CONDITIONS, HITEC® 544 HYDRAULIC ADDITIVE IS A FORCE TO BE RECKONED WITH.

WHERE TOLERANCES ARE TIGHT HITEC® 544, AFTON'S ZINC-FREE HYDRAULIC ADDITIVE PACKAGE, WORKS TIRELESSLY TO BOOST OXIDATION STABILITY AND EXTEND DRAIN INTERVALS – HELPING REDUCE DOWNTIME, FLUID COSTS AND ENVIRONMENTAL IMPACT.

DESIGNED TO POWER THROUGH DEPOSIT BUILD-UP, CONTROL SLUDGE AND PROTECT CRITICAL COMPONENTS, MEETING THE MOST CHALLENGING OEM REQUIREMENTS, INCLUDING BOSCH REXROTH RDE 90245 FLUID RATING.

PERFORMANCE, EFFICIENCY AND REASSURANCE – HITEC® 544 – AT THE HEART OF YOUR HYDRAULIC SYSTEM.

www.aftonchemical.com

INDUSTRIAL

Afton
CHEMICAL
Passion for Solutions®



78th STLE Annual Meeting & Exhibition • Minneapolis, MN

Contents

- 2 Welcome Message
- 3 Program Schedule at a Glance
- 6 STLE Technical Committee Meetings Schedule
- 6 Education Course Index
- 7 Technical Sessions and Commercial Marketing Forum Index
- 8 Minneapolis Convention Center Floor Plans
- 10 Annual Meeting Exhibitors
- 11 Trade Show Floor Plan
- 12 Annual Meeting Sponsors
- 14 **General Information and Policies**
 - Exhibition Hours
 - Registration Information and Registration Hours
 - Annual Meeting and Education Course Policies
 - Recording Policy
 - Photo Policy
 - Cellular Phone Policy
 - Dress Code
 - Harassment Policy
 - Statement on Diversity and Inclusion
 - Future Industry Meeting Dates
- 16 **Annual Meeting Special Events**
 - STLE New Member & Student Networking Reception (Sunday evening)
 - Opening General Session (Monday morning)
 - STEM Camp (Monday morning)
 - Networking Reception (Monday evening)
 - Exhibitor Appreciation Hour (Monday & Tuesday)
 - President's Luncheon/STLE Business Meeting (Tuesday Afternoon)
- 17 **Keynote Address – Opening General Session**
“Tribology in the New Space Economy”
Speaker: **Brian Dykas**, Ph.D, PE, Senior Materials and Process Engineer, Blue Origin

Panel Discussions & Plenary Sessions
 - STLE Sustainability Forum, pg. 18
 - Women in Tribology Panel, pg. 19
 - Worldwide Surface Topography Challenge, pg. 20

21 **Education Courses and Instructors**

26 **2024 STLE Award Recipients**

Sunday/Monday Overview

Time Grid (Monday Technical Sessions) pg. 30

34 Monday Technical Sessions & Commercial Marketing Forum

Tuesday Overview

Time Grid (Tuesday Technical Sessions) pg. 54

58 Tuesday Technical Sessions & Commercial Marketing Forum

Wednesday Overview

Time Grid (Wednesday Technical Sessions) pg. 82

86 Wednesday Technical Sessions & Commercial Marketing Forum

Thursday Overview

Time Grid (Thursday Technical Sessions) pg. 118

122 Thursday Technical Sessions & Commercial Marketing Forum

148 **Posters**

- Early Career
- Graduate

154 Participants Index

163 **Special Acknowledgments**

- 2023-2024 STLE Board of Directors
- Annual Meeting Program Committee
- Annual Meeting Education Course Committee
- Awards Committee
- Diversity, Equity, and Inclusion Committee
- Education Committee
- Exhibitor Advisory Committee
- Fellows Committee
- Technical Committees

166 Advertisers Index

167 Notes Pages

The 2024 STLE Annual Meeting & Exhibition is sponsored by the Society of Tribologists and Lubrication Engineers, an international organization headquartered at 840 Busse Highway, Park Ridge, Illinois (USA) 60068-2376. Telephone: (847) 825-5536. Fax: (847) 825-1456. Email: information@stle.org. Web: www.stle.org. STLE is a not-for-profit professional society founded in 1944 to advance the science of tribology and best practices in lubrication engineering.



Welcome to #STLE2024

Dear Members, Friends and Guests,

On behalf of the entire STLE community, we are pleased to welcome you to the **78th Annual Meeting & Exhibition!** Two key STLE committees, the **Annual Meeting Program Committee** and the **Education Committee**, have organized an exciting week of education, training, and professional development here at the Minneapolis Convention Center (MCC). This year, STLE is celebrating 80 years of technical excellence and innovation. To celebrate the anniversary, special events are being planned throughout the year, including promotion here in Minneapolis.

The 2024 technical program includes some 500 presentations in a new 20- or 40-minute format that allows for shorter and fewer parallel sessions so there is more time to network with and learn from your peers. We also have 11 lubrication-specific education courses, with three new offerings to prepare attendees for the future of the tribology and lubricants industry. On Sunday, May 19, an interactive half-day course will focus on machine learning and artificial intelligence to help solve tribological problems. On Wednesday, May 22, the Auto/Diesel, Gasoline, Hydrogen and Ammonia education course will provide an overview of engine and drivetrain and lubrication requirements for internal combustion engines. Additionally, we have the Electric Vehicles 202 course on Thursday, May 23 that will offer more advanced topics in EV technologies and lubrication.

Other special programming events include two new panel discussions on topics that are key to the tribology and lubrication engineering community. One panel, STLE's Sustainability Forum, on Monday, May 20, from 5-6 p.m., will highlight various sustainability topics from top industry experts, including standards, regulations, technologies, and best practices. The other panel, "Women in Tribology," on Tuesday, May 21, from 5-6 p.m., which is open to all attendees, will feature notable women in the lubrication industry and insights about their career paths and experiences. STLE will also host the Worldwide Surface Topography Challenge, on Wednesday, May 22, from 5-6 p.m. This plenary session will include more than 150 tribologists from around the world that conducted over 2,000 individual measurements of the same surface topography—and their results from the challenge will be presented for the first time to attendees.

Please also allow time in your schedule to visit over 100 companies displaying their products and services in the trade show. The Exhibit Hall in the MCC is completely sold out, and this is an opportunity to get an early look at the most innovative products and services the lubricants industry has to offer as well as expand your professional network. The student and early career posters are also on display in the Exhibit Hall.

Don't forget to take advantage of the social events, including the Networking Reception on Monday at 6 p.m., at the Hilton Minneapolis, which is connected to the MCC, and the President's Luncheon/STLE Business Meeting on Tuesday at 12 p.m. You'll connect with the STLE community and have a chance to recognize this year's award recipients and top volunteers who generously donated their time and effort to create new programs and opportunities for the tribology and lubrication communities.

Use this Program Guide and the new STLE Mobile App to navigate your meeting experience. Be sure to download the app, available for Apple and Android, to track your itinerary, view abstracts and receive important meeting updates. You can search "STLE Mobile" and download in the App Store today, or see page 13 for details! For assistance using the new app, visit the STLE Membership Booth where staff will be able to help you. We also encourage you to connect on STLE's social media platforms using the official hashtag **#STLE2024** to share your experiences throughout the week.

STLE's 2024 Annual Meeting & Exhibition is a singular opportunity for all of us to connect, learn, and achieve together. Have a great week and enjoy the Annual Meeting!



Dr. Hong Liang
Texas A&M University
2023-2024 STLE
President



Dr. Ashlie Martini
University of California, Merced
2024 Annual Meeting Program
Chair

2024 STLE Annual Meeting & Exhibition

Program schedule at a glance

All sessions and events will take place in the Minneapolis Convention Center unless otherwise noted.



Saturday, May 18

Onsite Registration

12:00 pm – 6:00 pm – **Convention Center Foyer**

Sunday, May 19

Onsite Registration

6:30 am – 6:00 pm – **Convention Center Foyer**

Education Course Speakers Breakfast

7:00 am – 7:45 am – **Seasons**

Education Courses (8:00 am – 5:00 pm) – **registration required**

- Advanced Lubrication 301: Advanced Additives – **200 C**
- Basic Lubrication 103 – **104 A**
- Electric Vehicles 101 – **200 I**
- Grease 101 (in partnership with NLGI) – **200 DE**
- **NEW!** Machine Learning and Artificial Intelligence in Tribology (Half-day course): 1:00 pm – 5:00 pm – **200 B**
- Metalworking Fluids 105: Introduction of Metal Forming Fluids – **200 H**

Education Course Breaks – **Foyer**

Invitation Only: STLE Section Leadership Training

4:30 pm – 5:45 pm – **200 J**

Ticked Event/Invitation Only: Student and New Member Networking Reception

6:00 pm – 7:30 pm – **Seasons**

Monday, May 20

Onsite Registration

6:30 am – 6:00 pm – **Convention Center Foyer**

Speakers Breakfast

7:00 am – 7:45 am – **Seasons**

Technical Sessions (8:00 am – 10:00 am)

- 1A • Tribochemistry I – **101 B**
- 1B • Tribotesting I – **101 C**
- 1C • Contact Mechanics I – **101 D**
- 1D • Synthetic Lubricants and Hydraulics I – **101 E**
- 1F • Nanotribology I – **101 G**
- 1G • Surface Engineering I – **101 H**
- 1I • Commercial Marketing Forum I – **101 J**
- 1J • Electric Vehicles I – **200 DE**

2024 STLE Annual Meeting & Exhibition

Program schedule at a glance

Monday, May 20 | continued

Networking/Refreshment Break

10:00 am – 10:30 am – **Grand Ballroom Foyer**

Opening General Session: Keynote Address

10:30 am – 12:00 pm – **Grand Ballroom**



- **“Tribology in the New Space Economy”**

Speaker: **Brian Dykas**, Ph.D, PE, Senior Materials and Process Engineer, Blue Origin

Lunch (on your own) – 12:00 pm – 1:40 pm

Commercial Exhibits and Posters

12:00 pm – 5:00 pm – **Exhibit Hall B**

Technical Sessions (1:40 pm – 5:00 pm)

- 2A • Tribochemistry II – **101 B**
- 2B • Tribotesting II – **101 C**
- 2C • Contact Mechanics II – **101 D**
- 2D • Grease I – **101 E**
- 2F • Nanotribology II – **101 G**
- 2G • Surface Engineering II – **101 H**
- 2I • Commercial Marketing Forum II – **101 J**
- 2J • Electric Vehicles II – **200 DE**

Exhibitor Appreciation Break

3:00 pm – 4:00 pm – **Exhibit Hall B**



STLE Sustainability Forum

5:00 pm – 6:00 pm – **Seasons**

Networking Reception

6:00 pm – 7:30 pm – **Hilton Minneapolis**

Tuesday, May 21

Onsite Registration

6:30 am – 6:00 pm – Convention Center Foyer

Speakers Breakfast

7:00 am – 7:45 am – **Seasons**

Commercial Exhibits and Posters

9:30 am – 5:30 pm – **Exhibit Hall B**

Technical Sessions (8:00 am – 12:00 pm)

- 3A • Materials Tribology I: Tribute to Michael Dugger – **101 B**
- 3B • Tribotesting III – **101 C**
- 3C • Lubrication Fundamentals I: Additives – **101 D**
- 3D • Grease II – **101 E**
- 3E • Biotribology I – **101 F**
- 3F • Nanotribology III – **101 G**
- 3I • Commercial Marketing Forum III – **101 J**
- 3J • Electric Vehicles III – **200 DE**

Networking/Refreshment Break

10:00 am – 10:40 am – **Exhibit Hall B**

President’s Luncheon/STLE Business Meeting

12:00 pm – 2:00 pm – **Grand Ballroom**

Technical Sessions (2:00 pm – 5:00 pm)

- 4A • Materials Tribology II: Tribute to Michael Dugger – **101 B**
- 4C • Lubrication Fundamentals II: Marine Lubrication – **101 D**
- 4D • Grease III – **101 E**
- 4E • Biotribology II – **101 F**
- 4F • Seals I – **101 G**
- 4I • Commercial Marketing Forum IV – **101 J**
- 4J • Electric Vehicles IV – **200 DE**

Exhibitor Appreciation Break

3:00 pm – 4:00 pm – **Exhibit Hall B**



Women in Tribology Panel

(Open to all attendees)

5:00 pm – 6:00 pm – **Seasons**

2024 STLE Annual Meeting & Exhibition

Program schedule at a glance

Wednesday, May 22

Onsite Registration

6:30 am – 6:00 pm – **Convention Center Foyer**

Speakers Breakfast

7:00 am – 7:45 am – **Seasons**

Commercial Exhibits and Posters

9:30 am – 12:00 pm – **Exhibit Hall B**

Education Courses (8:00 am – 5:00 pm) – *registration required*

- Advanced Lubrication 302: Advanced Lubrication Regimes – **200 F**
- **NEW!** Auto/Diesel, Gasoline, Hydrogen and Ammonia – **200 J**
- Metalworking Fluids 240: Metalworking Fluid Formulation Concepts – **200 H**
- Sustainability: Biolubricants and Biofuels – **200 G**

Technical Sessions (8:00 am – 12:00 pm)

- 5A • Materials Tribology III – **101 B**
- 5B • Condition Monitoring I – **101 C**
- 5C • Lubrication Fundamentals III: Sustainable Lubrication – **101 D**
- 5D • Gears I – **101 E**
- 5E • Tribology of Biomaterials I – **101 F**
- 5F • Sustainable Power Generation I – **101 G**
- 5G • Fluid Film Bearings I – **101 H**
- 5I • Commercial Marketing Forum V – **101 J**
- 5J • Electric Vehicles V – **200 DE**

Networking/Refreshment Break

10:00 am – 10:40 am – **Exhibit Hall B**

Lunch (on your own) – 12:00 pm – 1:40 pm

Technical Sessions (1:40 pm – 5:00 pm)

- 6A • Materials Tribology IV – **101 B**
- 6B • Condition Monitoring II – **101 C**
- 6C • Lubrication Fundamentals IV: Oil Degradation – **101 D**
- 6D • Rolling Element Bearings I – **101 E**
- 6E • Environmentally Friendly Fluids I – **101 F**
- 6F • Sustainable Power Generation II – **101 G**
- 6G • Tribochemistry III – **101 H**
- 6I • Commercial Marketing Forum VI – **101 J**
- 6J • Electric Vehicles VI – **200 DE**

Networking/Refreshment Break

3:00 pm – 3:40 pm – **Convention Center Foyer**



Worldwide Surface Topography Challenge

5:00 pm – 6:00pm – **101 G**

Thursday, May 23

Onsite Registration

6:30 am – 12:00 pm – **Convention Center Foyer**

Speakers Breakfast

7:00 am – 7:45 am – **Seasons**

Education Course (8:00 am – 5:00 pm) – *registration required*

- **NEW!** Electric Vehicles 202 – **200 FG**

Technical Sessions (8:00 am – 12:00 pm)

- 7A • Materials Tribology V – **101 B**
- 7B • Condition Monitoring III – **101 C**
- 7C • Metalworking Fluids I – **101 D**
- 7D • Rolling Element Bearings II – **101 E**
- 7E • Environmentally Friendly Fluids II – **101 F**
- 7F • AI and Machine Learning I – **101 G**
- 7J • Electric Vehicles VII – **200 DE**
- 7K • Wear I – **200 B**
- 7L • Nonferrous Metals I – **200 A**

Networking/Refreshment Break

10:00 am – 10:40 am – **Convention Center Foyer**

Lunch (on your own) – 12:00 pm – 1:40 pm

Technical Sessions (1:40 pm - 5:00 pm)

- 8A • Materials Tribology VI – **101 B**
- 8C • Metalworking Fluids II – **101 D**
- 8D • Rolling Element Bearings III – **101 E**
- 8E • Environmentally Friendly Fluids III – **101 F**
- 8F • AI and Machine Learning II – **101 G**
- 8K • Wear II – **200 B**

Networking/Refreshment Break

3:00 pm – 3:20 pm – **Convention Center Foyer**

Preliminary as of April 23, 2024



2024 STLE Technical Committee Meetings

STLE Technical Committee meetings are open to all registered attendees to discuss technical or programming topics, as well as present recommendations to committee leaders in a public forum.

CATEGORY	SESSION	DATE	TIME	ROOM
Synthetic Lubricants & Hydraulics	1D	Monday, May 20	10:30 am – 11:30 am	101 E
Contact Mechanics	2C	Monday, May 20	4:40 pm – 5:40 pm	101 D
Nanotribology	2F	Monday, May 20	5:00 pm – 6:00 pm	101 G
Surface Engineering	2G	Monday, May 20	5:00 pm – 6:00 pm	101 H
Tribotesting	2B	Monday, May 20	4:40 pm -5:40 pm	101 C
Biotribology	4E	Tuesday, May 21	4:20 pm – 5:00 pm	101 F
Grease	4D	Tuesday, May 21	4:40 pm – 5:40 pm	101 E
Seals	4F	Tuesday, May 21	5:00 pm – 6:00 pm	101 G
Gears	5D	Wednesday, May 22	11:40 am – 12:00 pm	101 E
Fluid Film Bearings	5G	Wednesday, May 22	12:00 pm – 12:30 pm	101 H
AI and Machine Learning	—	Wednesday May 22	4:20 pm – 5:00 pm	202 B
Lubrication Fundamentals	6C	Wednesday, May 22	4:20 pm – 5:00 pm	101 D
Condition Monitoring	6B	Wednesday, May 22	4:40 pm – 5:00 pm	101 C
Electric Vehicles	6J	Wednesday, May 22	4:40 pm – 5:00 pm	200 DE
Sustainable Power Generation	6F	Wednesday, May 22	4:40 pm – 5:00 pm	101 G
Environmentally Friendly Fluids	6E	Wednesday, May 22	5:00 pm – 5:30 pm	101 F
Rolling Elements Bearings	6D	Wednesday, May 22	5:00 pm – 5:30 pm	101 E
Materials Tribology	6A	Wednesday, May 22	5:00 pm – 6:00 pm	101 B
Wear	7K	Thursday, May 23	11:40 am – 12:00 pm	200 B
Nonferrous Metals	7L	Thursday, May 23	12:00 pm – 12:30 pm	200 A
Metalworking Fluids	8C	Thursday, May 23	4:40 pm – 5:00 pm	101 D

Education Course Index

Education Courses (8:00 am to 5:00 pm)– *registration required*

Sunday, May 19

- Advanced Lubrication 301: Advanced Additives, **pg. 21**
- Basic Lubrication 103, **pg. 21**
- Electric Vehicles 101, **pg. 22**
- Grease 101 (in partnership with NLGI), **pg. 22**
- **New!** Machine Learning and Artificial Intelligence in Tribology (Half-day course: 1:00 pm – 5:00 pm), **pg. 23**
- Metalworking Fluids 105: Introduction to Metal Forming Fluids, **pg. 23**

Wednesday, May 22

- Advanced Lubrication 302: Advanced Lubrication Regimes, **pg. 24**
- **New!** Auto/Diesel, Gasoline, Hydrogen and Ammonia, **pg. 24**
- Metalworking Fluids 240: Metalworking Fluid Formation Concepts, **pg. 24**
- Sustainability: Biolubricants and Biofuels, **pg. 25**

Thursday, May 23

- **New!** Electric Vehicles 202, **pg. 25**

Technical Sessions and Commercial Marketing Forum Index

Monday, May 20

Technical Sessions (8:00 am – 10:00 am)

- 1A • Tribochemistry I, pg. **34**
- 1B • Tribotesting I, pg. **35**
- 1C • Contact Mechanics I, pg. **36**
- 1D • Synthetic Lubricants and Hydraulics I, pg. **37**
- 1F • Nanotribology I, pg. **38**
- 1G • Surface Engineering I, pg. **40**
- 1I • Commercial Marketing Forum I, pg. **40**
- 1J • Electric Vehicles I, pg. **42**

Technical Sessions (1:40 pm – 5:00 pm)

- 2A • Tribochemistry II, pg. **44**
- 2B • Tribotesting II, pg. **45**
- 2C • Contact Mechanics II, pg. **46**
- 2D • Grease I, pg. **47**
- 2F • Nanotribology II, pg. **48**
- 2G • Surface Engineering II, pg. **49**
- 2I • Commercial Marketing Forum II, pg. **50**
- 2J • Electric Vehicles II, pg. **51**

Tuesday, May 21

Technical Sessions (8:00 am – 12:00 pm)

- 3A • Materials Tribology I, pg. **58**
- 3B • Tribotesting III, pg. **59**
- 3C • Lubrication Fundamentals I: Additives, pg. **60**
- 3D • Grease II, pg. **62**
- 3E • Biotribology I, pg. **64**
- 3F • Nanotribology III, pg. **66**
- 3I • Commercial Marketing Forum III, pg. **68**
- 3J • Electric Vehicles III, pg. **69**

Technical Sessions (2:00 pm – 6:00 pm)

- 4A • Materials Tribology II, pg. **72**
- 4C • Lubrication Fundamentals II: Marine Lubrication, pg. **74**
- 4D • Grease III, pg. **76**
- 4E • Biotribology II, pg. **76**
- 4F • Seals I, pg. **77**
- 4I • Commercial Marketing Forum IV, pg. **78**
- 4J • Electric Vehicles IV, pg. **79**

Wednesday, May 22

Technical Sessions (8:00 am – 12:00 pm)

- 5A • Materials Tribology III, pg. **86**
- 5B • Condition Monitoring I, pg. **88**
- 5C • Lubrication Fundamentals III: Sustainable Lubrication, pg. **92**
- 5D • Gears I, pg. **94**
- 5E • Tribology of Biomaterials I, pg. **96**
- 5F • Sustainable Power Generation I, pg. **98**
- 5G • Fluid Film Bearings I, pg. **99**
- 5I • Commercial Marketing Forum V, pg. **101**
- 5J • Electric Vehicles V, pg. **104**

Technical Sessions (1:40 pm – 5:00 pm)

- 6A • Materials Tribology IV, pg. **105**
- 6B • Condition Monitoring II, pg. **108**
- 6C • Lubrication Fundamentals IV: Oil Degradation, pg. **109**
- 6D • Rolling Element Bearings I, pg. **110**
- 6E • Environmentally Friendly Fluids I, pg. **112**
- 6F • Sustainable Power Generation II, pg. **113**
- 6G • Tribochemistry III, pg. **115**
- 6I • Commercial Marketing Forum VI, pg. **115**
- 6J • Electric Vehicles VI, pg. **115**

Thursday, May 23

Technical Sessions (8:00 am – 12:00 pm)

- 7A • Materials Tribology V, pg. **122**
- 7B • Condition Monitoring III, pg. **124**
- 7C • Metalworking Fluids I, pg. **126**
- 7D • Rolling Element Bearings II, pg. **128**
- 7E • Environmentally Friendly Fluids II, pg. **130**
- 7F • AI and Machine Learning I, pg. **132**
- 7J • Electric Vehicles VII, pg. **134**
- 7K • Wear I, pg. **135**
- 7L • Nonferrous Metals I, pg. **138**

Technical Sessions (1:40 pm – 5:00 pm)

- 8A • Materials Tribology VI, pg. **140**
- 8C • Metalworking Fluids II, pg. **141**
- 8D • Rolling Element Bearings III, pg. **144**
- 8E • Environmentally Friendly Fluids III, pg. **145**
- 8F • AI and Machine Learning II, pg. **146**
- 8K • Wear II, pg. **147**



2024 STLE – Minneapolis Convention Center Floor Plans

Exhibit Dates:

May 20-22, 2024

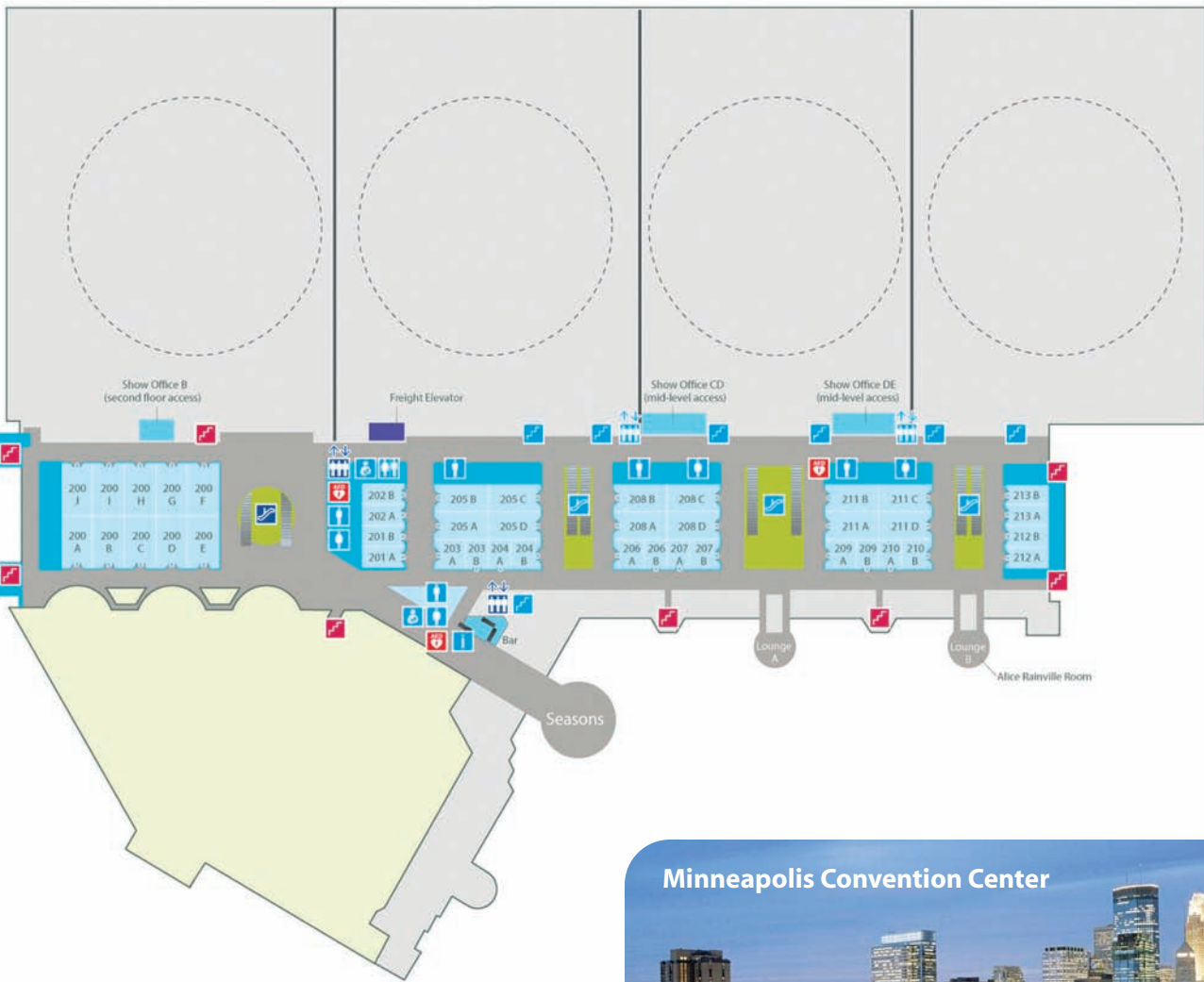
• Exhibit Setup Hours:

Sunday: 12:00 pm – 5:00 pm &
Monday: 6:00 am – 11:00 am

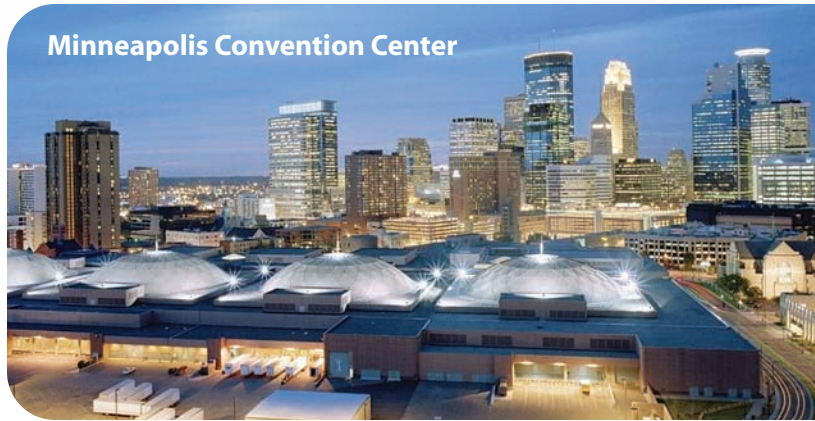
• Exhibit Hours:

Monday: 12:00 pm – 5:00 pm
Tuesday: 9:30 am – 12:00 pm &
2:00 pm – 5:30 pm
Wednesday: 9:30 am – 12:00 pm





LEVEL TWO





2024 STLE Annual Meeting Exhibitors

The exhibitors listed are displaying the lubricant industry's latest products, services & technologies.

COMPANY NAME	BOOTH #	COMPANY NAME	BOOTH #	COMPANY NAME	BOOTH #
Acme-Hardesty Company	222/224	Evonik Oil Additives USA, Inc.....	303	PCC Rokita & PCC-Chemax.....	517
ADEKA USA Corporation	523	ExxonMobil Product Solutions	203	PCS Instruments	508/510/512
Advanced Chemical Concepts Inc...	214	Falex Corporation.....	213	Phoenix Tribology Ltd.....	106
Agilent Technologies	325	FedChem/Federal Process.....	112	Pilot Chemical Company	618
Amee Castor & Derivatives Ltd.....	426	Fuel Ox	526	Polytec.....	625
American Petroleum Institute	614	Functional Products, Inc.....	117	Radom Corp.	429
American Refining Group, Inc.	323	Gehring-Montgomery	129/228	Ravago Chemicals North America..	103
AnalytiChem	327	GEO Specialty Chemicals.....	329	Redlist.....	628
Anhui Trust Chem Co., Ltd.	318	Green Oleo S.p.A.....	608	Rianlon Americas, Inc.	619
Argonne National Laboratory.....	528	Halo Enterprises.....	622	Richful Lube Additives.....	403
Anton Paar USA.....	128	Hangzhou Sungate.....	130	Rierden Chemical & Trading	617
Ayaltical Instruments	425/427	Huntsman	113	Rtec Instruments, Inc.	109/111
Barentz North America, LLC.....	115	IMCD US	229/328	Rudolph Research Analytical	624
Baron USA, LLC	126	Indorama.....	503	Sasol Chemicals.....	422/424
BASF	509/511	Industrial Quimica Lasem S.A.U.	513/515	Savant Labs.....	215
Biosan Laboratories, Inc.	505	INEOS Oligomers	322/324	Sea-Land Chemical Company.....	308
Biosynthetic Technologies	127	Infineum International	227	SI Group	319
Bruker	119	Ingevity.....	118	Simerics, Inc.	216
Cannon Instrument Company	522	Italmatch Chemicals	413/415	Soltex, Inc.	326
Cargill.....	418	Ivanhoe Industries Inc.	607	SONGWON International – Americas Inc	312
ChemCeed	612	J. Mike Walker '66 Department of Mechanical Engineering, TAMU	212	Syensqo.....	223/225
Coast Southwest, Inc.	623	Kanghua Chemical Co., Ltd.	629	Tannas Company & King Refrigeration	217
Colonial Chemical Inc.....	123/125	Kao Chemicals Europe, S.L.U.	310	Teknor Apex Company.....	613
Compass Instruments	209/211	KH Neochem Americas, Inc.	110	The Lubrizol Corporation.....	315/317
DataPhysics Instruments USA Corp.	610	King Industries, Inc.	408/410	Total Energies	604
DC Scientific	616	Koehler Instrument Company, Inc.....	414/416	Tulstar Products, Inc.....	524
DL Chemical Co., Ltd.....	124	LANXESS Corporation	102/104	TUNAP GmbH & Co. KG.....	122
Dover Chemical Corporation	219	Lazer Scientific Inc.....	226	United Soybean Board	621
Dow	116	Microtap	131	Univar Solutions.....	516/518
Dowpol Chemical International Corporation	602	MOL-LUB Ltd.....	626	Vanderbilt Chemicals, LLC	208
Ducom	603/605	Münzing.....	311	Vantage.....	529
Eastman Chemical Company	519	Napoleon Engineering Services.....	218	VBase Oil Company	309
Ebatco.....	609	Nelson Brothers	627	Vibration Institute	611
ECH America	525	Nouryon.....	514	Wincom, Inc.	120
Elé Corporation	108	Optimol Instruments Pruftechnik GmbH.....	114	Zschimmer & Schwarz.....	423
Elemental Scientific	527	PAC LP.....	615		
Emery Oleochemicals	314/316	Palmer Holland Inc.	417/419		
Ergon, Inc.	409/411				

Preliminary as of April 23, 2024



Exhibit Hall Trade Show Floor Plan

The exhibition is located in the Minneapolis Convention Center – Exhibit Hall B.

631	630	531	530	431	430	331	330	231	230	131	Hangzhou Sungate
Kanghua Chemical	Redlist	Vantage	Argonne National Labs	Radom Corp.		GEO Specialty Chemicals	IMCD US		Gehring-Montgomery		Anton-Paar
629	628	529	528	429	428	329	328/229		228/129		128
Nelson Brothers	MOL-LUB	Elemental Scientific	Fuel Ox	Ayaltical Instr.	Amee Castor & Derivatives	Analyti-Chem	Soltex, Inc.	Infineum Intl.	Lazar Scientific	Bio-synthetic Tech.	Baron USA
627	626	527	526		426	327	326	227	226	127	126
Polytec	Rudolph Research Analytical	ECH America	Tulstar Products	425/427	Sasol Chemicals	Agilent Tech.	INEOS Oligomers	Syensqo	Acme-Hardesty Co.	Colonial Chemical	DL Chemical Corp.
625	624	525	622	423	422/424	323	322/324	223/225	222/224	123/125	124
Coast South-west	Halo Enterprises	ADEKA USA Corp.	Cannon Instr. Co.	Zschimmer & Schwarz		American Refining Group					TUNAP
623	622	523	622	423							122
United Soybean Board											Wincom
621											120
Rianlon Americas	Pilot Chemical Co.	Eastman	Univar Solutions	Palmer Holland	Cargill	SI Group	Anhui Trust Chem Co.	Dover Chemical Corp.	Napoleon Engineering Services	Brucker	Ingevity
619	618	519	516/518	417/419	418	319	318	219	218	119	118
Rierden Chemical & Trading	DC Scientific	PCC-Chemax	Nouryon	Italmatch Chemicals	Koehler Instr. Co.	The Lubrizol Corp.	Emery Oleo-chemicals	Tannas Co. & King Refrigeration	Simerics	Functional Products	Dow
617	616	517	514		413/415	414/416	315/317	217	216	117	116
PAC LP	American Petroleum Institute	Industrial Quimica Lasem	PCS-Instr.	Ergon, Inc.	King Industries	MUNZING	Savant Labs	Songwon	Advanced Chemical Co.	Barentz North America	Optimol Instr.
615	614	515					508/510/512	409/411	408/410	309	215
Teknor Apex Co.	Chem-Ceed						Compass Instr.	Falex Corp.	TAMU	Huntsman	FedChem
613	612	513/515					312	213	212	113	112
Vibration Institute	Data-Physics Instr.	BASF Corp.					Kao Chemicals	Vanderbilt Chemicals		Rtec-Instr., Inc.	KH Neochem Americas
611	610	511					310		209/211	208	110
Ebatco	Green Oleo Spa						Sea-Land Chemical Co.				Ele Corp.
609	608	509/511					308				108
Ivanhoe Industries											Phoenix Tribology
607											106
Ducom	Total Energies	Biosan	Richful Lube Additives		Evonik Oil Additives		ExxonMobil Products & Solutions		Ravago Chemicals North America		LANXESS Corp.
603/605	604	505	403		303		203		103		102/104
	DowPol Chemical Corp.	Indorama Corp.									
	602	503									



2024 STLE Annual Meeting Sponsors

STLE wishes to thank the following sponsors for their generous support of the 78th STLE Annual Meeting & Exhibition. Visit www.stle.org/annualmeeting for the most up-to-date list of additional sponsors and onsite signage in Minneapolis.

Rhodium Plus Level (\$5,000+)

Azelis L&MF US

Registration Bags

Ergon, Inc.

Badge Lanyards

The Lubrizol Corporation

Guest Room Keycards

Rhodium Level (\$5,000)

SK Enmove

Keynote Session

Palladium Plus Level (\$4,000+)

Advancion Corporation

Directional Floor Signs

Shell

Education Course Lunches

SK Enmove

Refreshment Breaks

Palladium Level (\$4,000)

Palmer Holland, Inc.

Annual Meeting Mobile App

Titanium Plus Level (\$3,000+)

Afton Chemical Corporation

Relaxation/Recharging Lounge

Evonik Oil Additives USA, Inc.

Exhibitor Appreciation Hour Raffle

Ideas, Inc.

Welcome Gift

Titanium Level (\$3,000)

BASF

President's Luncheon

Cargill

Education Course Materials

Vanderbilt Chemicals, LLC

Networking Reception

Platinum Level (\$2,000)

Biosynthetic Technologies

Recycling Bins

Chevron Oronite

Speakers Breakfast

Daubert Chemical Company, Inc.

Speakers Breakfast

King Industries, Inc.

Networking Reception

Sea-Land Chemical Company

Networking Reception

STLE Chicago Section

Networking Reception

Gold Level (\$1,000)

Compass Instruments

Networking Reception

Falex Corporation

Networking Reception

IMCD

Networking Reception

INEO Oligomers

Networking Reception

Soltex, Inc.

Networking Reception

SONGWON Management AG

Networking Reception

STLE Alberta Section

Networking Reception

STLE Detroit Section

Networking Reception

The Timken Company

Networking Reception

Zschimmer & Schwarz

Networking Reception

Preliminary as of April 23, 2024



MINNEAPOLIS

Manage your STLE Annual Meeting plans right from your phone.



78th STLE Annual Meeting & Exhibition

Minneapolis Convention Center | Minneapolis, Minnesota (USA)

STLE's Annual Meeting offers so much programming that keeping track of what's happening when and where can be a challenge. The STLE Mobile App lets you plan your itinerary and stay on top of fast-breaking meeting updates every minute of the day.

The STLE Mobile App lets you track, schedule and connect during the STLE Annual Meeting with:

- ◆ Nearly 500 technical session abstracts—push a button and it's on your itinerary!
- ◆ Paper presenters—easily find your favorite speakers
- ◆ 11 lubrication-specific courses
- ◆ More than 100 exhibitors at the trade show
- ◆ Special events and networking opportunities
- ◆ Floor plans of the Minneapolis Convention Center and exhibition
- ◆ Meeting attendees
- ◆ Meeting sponsors
- ◆ Meeting updates—stay on top of late-breaking news
- ◆ STLE Open Community discussion forum

Download the app—
and don't miss a thing!



Log in using your STLE member ID
and password.

Once in the mobile app, go to the 2024
STLE Annual Meeting & Exhibition.

For additional questions about the app,
please contact Bruce Murgueitio at
bmurgueitio@stle.org.

Sponsored by **Palmer Holland**.



• connect • learn • achieve

Society of Tribologists and Lubrication Engineers
840 Busse Highway, Park Ridge, Illinois 60068 (USA)

P: (847) 825-5536 | F: (847) 825-1456 | www.stle.org | information@stle.org

Follow us on:    



General information and policies

The exhibition is in the Minneapolis Convention Center – Exhibit Hall B. (See map on page 11)

Exhibition Hours

- **Monday, May 20** (12:00 pm – 5:00 pm)
Exhibitor Appreciation Hour (3:00 pm – 4:00 pm)
 Evonik Raffle (3:30 pm) – Must be present to win. (Booth #303)
- **Tuesday, May 21** (9:30 am – 12:00 pm) & (2:00 pm – 5:30 pm)
 Closed for President’s Luncheon (12:00 pm – 2:00 pm)
Exhibitor Appreciation Hour (3:00 pm – 4:00 pm)
 Evonik Raffle (3:30 pm) – Must be present to win. (Booth #303)
- **Wednesday, May 22** (9:30 am – 12:00 pm)

Registration Information

Annual Meeting registration entitles you to attend the technical sessions, exhibition (Monday through Wednesday), Networking Reception on Monday evening, President’s Luncheon on Tuesday afternoon and most other sanctioned annual meeting events.

President’s Luncheon guest tickets are \$50 – free to STLE Corporate Members (**two tickets**) and students – and can be purchased at the STLE registration desk in the Hall B foyer of the Minneapolis Convention Center.

Attendance of business meetings of STLE technical committees is open to anyone who is registered for the meeting. See condensed schedule (pg. 6) for time and location of individual technical committee meetings.

Registration Hours

(All times are in central time zone)

- Saturday, May 18** (12:00 pm – 6:00 pm)
- Sunday, May 19** (6:30 am – 6:00 pm)
- Monday, May 20** (6:30 am – 6:00 pm)
- Tuesday, May 21** (6:30 am – 6:00 pm)
- Wednesday, May 22** (6:30 am – 6:00 pm)
- Thursday, May 23** (6:30 am – 12:00 pm)

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 exhibition, technical sessions, Commercial Marketing Forum and all social events, including the Monday evening Networking Reception and Tuesday afternoon President’s Luncheon.
- Distributing handouts at technical sessions is not permitted. Handouts will be given to education course attendees.
- Disseminating material or conducting business in the exhibit hall is not permitted if you are not an official exhibitor.

Recording Policy

Audio or video recording is not permitted in any of the annual meeting technical sessions or Commercial Marketing Forum presentations. 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 exhibition on Monday and Tuesday. These photos will be used in print materials promoting the 2025 STLE Annual Meeting & Exhibition in Atlanta, Georgia (USA). If you do not wish to have your photograph taken and published, please step out of the photo frame or notify the photographer afterwards if your photo has been taken so the image can be deleted.



May 19-23, 2024

STLE Mobile App – Download Today!

Program updates will be posted daily in the new STLE Annual Meeting App—available free for **iOS** and **Android**. Scan QR code below.



Annual Meeting section sponsored by Palmer Holland, Inc.

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.

Harassment Policy

STLE is committed to providing an atmosphere that encourages the free expression and exchange of scientific ideas. As part of that commitment, STLE is dedicated to promoting a safe and welcoming environment for all participants attending the STLE Annual Meeting & Exhibition. All participants are expected to abide by this policy in all venues at the STLE Annual Meeting, including ancillary events and official and unofficial social gatherings. Harassment of any kind is strictly prohibited, and the Society will not tolerate acts in violation of this policy. Any individual who believes that he or she has been the subject of, or has witnessed, harassment should immediately report the incident to STLE staff. All reports are confidential. A copy of the full policy is available at www.stle.org.

Statement on Diversity and Inclusion

STLE welcomes and encourages participation by all individuals. We strive to cultivate a society built on mentorship, encouragement, tolerance, and mutual respect, thereby engendering a welcoming environment for all. STLE welcomes your ideas and observations.

The STLE Diversity, Equity and Inclusion (DEI) Committee recommends policies, programs and activities intended to guide STLE's commitment to DEI. To send questions, issues, comments, suggestions or feedback to STLE, email community@stle.org.

Future Industry Meeting Dates

STLE Virtual Symposium: Green Tribology
July 24-25, 2024
Online

STLE Tribology & Lubrication for E-Mobility Conference
Detroit Marriott at Renaissance Center
October 23-25, 2024
Detroit, Michigan (USA)





79th STLE Annual Meeting & Exhibition
Hyatt Regency Hotel
May 18-22, 2025
Atlanta, Georgia (USA)

80th STLE Annual Meeting & Exhibition
Hyatt Regency New Orleans
May 17-21, 2026
New Orleans, Louisiana (USA)



Stay up to date on the latest annual meeting announcements and connect with fellow attendees using the conference hashtag **#STLE2024** on your favorite social media sites.

Connect with STLE:

-  LinkedIn | www.linkedin.com
-  X (formerly Twitter) | [Twitter.com/STLE_Tribology](https://twitter.com/STLE_Tribology)
-  Facebook | Facebook.com/stle.org
-  Instagram | Instagram.com/STLE_Tribology



2024 STLE Annual Meeting Special Events

All annual meeting events are in the Minneapolis Convention Center, unless noted.

New Member & Student Networking Reception

Sunday, May 19

6:00 pm – 7:30 pm | Hilton Minneapolis



Ticketed Event/Invitation Only: New STLE members and students are welcomed to come for an evening of networking and great food and to build friendships and expand your professional connections. This event is for new members and students only.

Opening General Session

Monday, May 20

10:30 am – 12:00 pm | Grand Ballroom

STLE honors its esteemed journal publishing award recipients during the Monday General Session program. You'll also hear a keynote presentation from Brian Dykas, Senior Materials and Process Engineer, Blue Origin, titled "**Tribology in the New Space Economy.**" (see page 17.)



Tribology STEM Camp

Monday, May 20

9:00 am – 2:00 pm | Exhibit Hall B

During STLE's 2024 Annual Meeting, the Society is hosting area high school school students for its 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 students interested in **STEM (science, technology, engineering and mathematics)** to careers in tribology and lubrication engineering.

Networking Reception

Monday, May 20

6:00 pm – 7:30 pm | 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.

Exhibitor Appreciation Hour

Back by popular demand, two hours of dedicated exhibit time will occur at this year's show:

Monday, May 20 & Tuesday, May 21

3:00 pm – 4:00 pm | Exhibit Hall B

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.

President's Luncheon & 78th STLE Annual Meeting Business Meeting

Tuesday, May 21

12:00 pm – 2:00 pm | Grand Ballroom



Hong Liang



Jack McKenna

Ticketed Event: 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 2023-2024 President Hong Liang with Texas A&M University and 2024-2025 President Jack McKenna with Sea-Land Chemical Company. A ticket for the President's Luncheon is included in your meeting registration and free to STLE Corporate Member representatives (two tickets) and students. Additional tickets may be purchased for \$50 per person at the STLE Registration Desk in the Convention Center Foyer.

2024 STLE Annual Meeting Keynote Address

Opening general session

Monday, May 20

10:30 am – 12:00 pm | Minneapolis Convention Center – **Grand Ballroom**

Keynote Speaker: Brian Dykas, Ph.D., Senior Materials and Process Engineer, Blue Origin



Tribology in the New Space Economy

In 2022, the number of objects launched into space exceeded the total quantity launched between 2000-2016. From today, the space economy is forecast to more than double by 2030, reaching up to \$1 trillion annually. For an industry that has historically been dominated by government funding, this renewed growth is increasingly driven by commercial investment and innovation.

A key feature of the newest generation of launch vehicles is reusability, enabling reductions in the cost of delivering payload to low earth orbit to under \$1000/lb. – a nearly order-of-magnitude reduction relative to previous generations of expendable launch vehicles. Reusability raises technical challenges in the design of propulsion, mechanical and structural systems, which must be designed for repeated exposure to launch and landing in seacoast and marine environments. This must be accompanied by order-of-magnitude longer lives than in expendable vehicles. At the same time, reductions in design cycle time and higher launch cadences allow for iterative approaches building on operational experience.

These trends offer renewed opportunities for tribology professionals to participate in the new space economy. Parallel hardware development and risk-based design approaches in the design of mechanical elements provide greater opportunity for hands-on learning and to reconsider previous design and technology constraints. Interdisciplinary and systems-based

engineering approaches, long underpinning the field of tribology, are in critical need. From mega-constellations of communications satellites to lunar and low-earth-orbiting space stations – to crewed return to the lunar surface – this talk explores some of the opportunities for tribologists and suppliers in the growing space industry.



Brian Dykas currently leads experimental tribology for propulsion systems at Blue Origin. In this role, he works with design teams across all internal engine programs to identify technical risks and design solutions for tribological interfaces, mechanisms, seals and bearings. During his time at Blue Origin, he has served in various roles, including leading the materials and processes review for human flight certification of the BE-3PM engine design for the New Shepard rocket.

Prior to joining Blue Origin, he spent over 10 years as an aerospace technologist and team leader at the US Army Research Laboratory (USARL) with a focus on aviation propulsion and power transmission research. While at the USARL, he was responsible for portfolio management for the Army's drivetrain and propulsion tribology research in collaboration with government, industry, academic, and international partners. He was selected for participation in the Engineer and Scientist Exchange Program at the Australian Defense Science and Technology Group in Melbourne, where he established collaborative research on aerospace and maritime propulsion diagnostics.

Brian earned a bachelor of science degree in aerospace engineering, as well as masters and doctorate degrees in mechanical engineering from Case Western Reserve University, respectively.



2024 STLE Panel Discussions & Plenary Session

All annual meeting events are in the Minneapolis Convention Center, unless noted.

STLE Sustainability Forum

Monday, May 20

5:00 pm – 6:00 pm | Seasons

STLE introduces its first-ever **Sustainability Forum**, open to all registered attendees, featuring a panel of top industry experts involved in various aspects of sustainability such as standards, regulations, technologies, and best practices. They will provide an update on progress being made on sustainability in their respective areas, and included will be an update on the work that STLE's Sustainability Committee has been conducting since its formation in November 2023.

The panel discussion will be followed by a Q&A session, where attendees will have the opportunity to ask questions and provide input to help STLE develop content to meet industry needs on sustainability.



Moderator: Dr. Neil Canter, CMFS, FSTLE, Chemical Solutions

Dr. Neil Canter is an STLE Fellow and an STLE Certified Metalworking Fluids Specialist (CMFS)[™], with more than 35 years of experience working in the lubricants industry. He received his doctorate in chemistry from the University of Michigan in 1983 and his bachelor's of science in chemistry from Brown University in 1978. Canter runs his own consulting company, Chemical Solutions, specializing in commercial development, marketing, product development and regulatory support for the lubricants industry. Canter is a member of STLE, the American Chemical Society (ACS), and the Society of Automotive Engineers (SAE). He is a contributing editor responsible for writing the monthly Tech Beat column in STLE's TLT magazine. He is also a member of STLE's Metalworking Fluid Education & Training Committee, STLE Education Committee, STLE Sustainability Committee and the program chair for the STLE Philadelphia Section. Besides providing technical and commercial support, he is also the host of STLE's Perfecting Motion[™] podcast.



Panelist: Dennis Bachelder, Senior Engineer, Engine Oil Licensing and Certification System, American Petroleum Institute (API)

Dennis Bachelder is a Senior Engineer with extensive experience in engine lubrication and performance. He currently works in the Engine Oil Licensing and Certification System at the American Petroleum Institute (API), managing

API 1509 specifications and developing new engine oil standards. Previously, Dennis held roles in lubricant development, testing, and product management at companies including General Electric, Teledyne Continental Motors, and Fairbanks Morse/SEMT Pielstick. He helped develop proprietary engine tests and set lubricant requirements for gasoline and diesel engines. Dennis earned his Bachelor of Science and Master of Science degrees in Mechanical Engineering from the University of Wisconsin-Madison. His educational background and hands-on work with leading engine manufacturers give him unique expertise in engine lubricant technology and performance requirements.



Panelist: Dr. Peter Lee, FSTLE, Institute Engineer & Chief Tribologist, Southwest Research Institute (SwRI)

Dr. Peter Lee is Institute Engineer and Chief Tribologist at Southwest Research Institute (SwRI) where he established SwRI's Tribology Research and Evaluation Laboratory in 2011. Under his leadership, the lab has become a center recognized

for its cutting-edge research and testing. He holds eight patents with one pending, has published 27 papers and presented more than 110 technical papers and seminars domestically and abroad. In 2018, he was named a Fellow of the Institution of Mechanical Engineers. He serves on STLE's Board of Directors and is a member of the Society of Automotive Engineers (SAE), the American Society of Mechanical Engineers (ASME), and the American Society of Testing Materials (ASTM). He is also an adjunct professor at Texas A&M University, serves on several editorial boards for tribology journals, and is a life member of the Tribology Society of India.



Panelist: Inga Herrmann, Sales Manager & Sustainability Lead, Ergon International Inc.

Inga Herrmann has been in the lubricant industry for about 25 years and has a unique perspective from professional and strategic selling, key account management and evaluating sustainability concepts for the lubricant industry. She has a bachelor's in business administration and holds a degree as

certified professional for lubricants technology. Inga is currently Sales Manager & Sustainability Lead at Ergon International Inc. Prior to joining Ergon, she was the head of the lubricants department at VSI – German Lubricant Manufacturers Association responsible for establishing a European sustainability standard for the lubricant industry and other lubricant topics like standardization of highest importance for the member companies. She worked as industrial key account manager at Shell Deutschland GmbH for more than two decades. The last years at Shell she was responsible for evaluating and gaining new business with OEMs and key customers in different segments of industrial lubrication, e.g., power generation, general manufacturing, auto components cement and steel, etc. with a focus of the grease business.



Panelist: Doug Sackett, CLS, MLT, Senior Field Engineer/blender QA/QC manager, TotalEnergies USA, Inc.

Doug Sackett is senior field engineer/blender QA/QC manager for TotalEnergies USA. He has more than 20 years of experience in the lubrication industry focusing on power generation, production and mining and providing lubrication services,

including lubricant selection, oil sampling, oil reclamation, filtration and vacuum dehydration, filter selection to ensure oil quality and purification standards for ensuring a reliability lubrication best-in-class program. He previously was general manager for a lubricant distributorship for 12 years helping develop the most stringent requirements for delivery of bulk and package lubricants to the end-user. He was first runner-up for Maintenance and Technology Magazine's Innovator of the Year Award in 2012 for the delivery processes and procedures ensuring ISO cleanliness specifications to the end-customer and helping evaluate and redesign the complete lubrication delivery program. He also redesigned a complete lubrication program for phosphate plants. Sackett holds the STLE Certified Lubrication Specialist[™] (CLS) certification and is immediate past chair of the STLE CLS Certification Committee. He is currently on the STLE Board of Directors.



Women in Tribology Panel

Tuesday, May 21

5:00 pm – 6:00 pm | Seasons

STLE's Board of Directors presents its first **Women in Tribology Panel**. This free-to-attend panel, open to all STLE Annual Meeting registrants, will focus on women in the industry, emphasizing their career paths and advice. Attendees can share their questions, thoughts, and experiences on bringing more women into the tribology and lubrication engineering field and helping to advance their careers.

The panel presentation will feature opening speakers and interactive discussions on key topics affecting women in the workplace.

If you have questions or comments you'd like to submit before the event, please email community@stle.org.



Moderator: Elaine Hepley, CLS, OMA, Solana Consulting Services LLC

Elaine Hepley, CEO of Solana Consulting Services LLC, has 15 years of industry experience with an emphasis on varnish analysis and testing techniques. Her passion is helping customers save money on equipment downtime and finding solutions to their problems, particularly when it comes to

varnish analysis. Over the years, she has helped develop new testing techniques to help identify the type of varnish formation and the stage of varnish formation. Hepley is the current chair of STLE's Oil Monitoring Analyst™ (OMA) Committee, paper solicitation chair for the STLE Wind Power Turbine Technical Committee and chair of STLE's Diversity, Equity, and Inclusion (DEI) Committee, and serves on the STLE Board of Directors. She also is a member of the STLE Lower Ohio River Valley (LORV) Section.



Panelist: Jennifer Altstadt, President & CEO, Sea-Land Chemical Company

Jennifer Altstadt is a dynamic professional with a solid educational foundation and extensive experience in both engineering and business. She earned her bachelor of science degree in industrial engineering from Purdue University, then furthering her expertise with a master of science degree from

Cleveland State University and an executive master of business administration degree from Case Western University. Altstadt's career has equipped her with a versatile skillset, allowing her to strategically navigate intricate environments. Currently, she serves as president and CEO of Sea-Land Chemical Company, which she joined in 2015. In this role, she is deeply committed to cultivating both businesses and individuals, driving excellence within the organization. Beyond her role at Sea-Land, Altstadt actively contributes to Haviland Enterprise, Inc., as a board member. She serves as chairperson for the Weatherhead School of Management's Visiting Committee. Her dedication extends to various civic initiatives, including Collaborate Cleveland and Cleveland Food Bank, where she volunteers alongside her husband, Mark, to make positive contributions to the community. Embracing a health-conscious and active approach to life, she leads a book club and engages in activities that promote personal and professional growth.



Panelist: Qian (Beth) Zou, FSTLE, Associate Dean & Professor/Co-Director of the Automotive Tribology Center, School of Engineering and Computer Science, Oakland University

Dr. Qian (Beth) Zou obtained her bachelor of science and master of science and doctorate degrees from Tsinghua

University (China) in 1992, 1994 and 2001, respectively, and joined Oakland University in 2002. She is currently the associate dean and professor of the School of Engineering and Computer Science and the co-director of the Automotive Tribology Center. Her research areas include nanofluids, automotive tribology, wear and scuffing modeling and testing, lubrication theory and contact mechanics analysis. Zou has published more than 100 papers in various peer-reviewed journals and conference proceedings. She is an STLE and SAE Fellow and active volunteer in both professional societies.



Panelist: Dr.-Ing. Mirjam Bäuse, Senior Engineer for Tribology & Oil/Global Functional Product Engineering Lead BB Oil, Magna Powertrain GmbH

Dr.-Ing. Mirjam Bäuse is a senior engineer for Tribology & Oil at Magna Powertrain GmbH & Co KG in Lannach, Austria, leading the company's global product engineering oil team. She is

also Global Functional Product Engineering Lead BB Oil. She began her career in the automotive industry over 20 years ago with an apprenticeship as a mechanic and earned bachelor of engineering and master of science degrees in mechanical engineering from the University of Applied Sciences Magdeburg-Stendal, Germany. Her fascination for tribology began during her studies through working in the tribology lab, leading to a doctorate in mechanical engineering and tribology at the Otto-von-Guericke University in Magdeburg and postgraduate studies in analytics and spectroscopy at University Leipzig.

Previously, she was a deputy professor for Machine Elements & Tribology and then transitioned to Magna to specialize in building expertise and solving specific issues in applied tribology in powertrain systems, with a focus on oils and wet clutches used as system components in conventional and electric vehicles. She also builds up and leads the global oil team. Actively engaged in the German Society for Tribology since 2012, she contributes to various voluntary activities, including establishing the Young Tribology Network as Working Group Lead and currently serves as Head of the Public Relations Working Group and a board director.

Now Available: STLE's new digital publication, **STLE Women in Tribology and Lubrication: Perspectives From Leaders in the Field**, is a free book sharing the stories and insights of 10 senior-level women with over 25 years of experience. The publication highlights the personal experiences of these women in their early careers leading up to their current roles, including the ups and downs of being a woman in the tribology and lubrication field, work-life balance and more. Order today at www.stle.org.



2024 STLE Panel Discussions & Plenary Session

All annual meeting events are in the Minneapolis Convention Center, unless noted.

Worldwide Surface Topography Challenge

Wednesday, May 22

5:00 pm – 6:00 pm | 101 G

Tribological performance depends on surface topography in virtually all real-world applications. Yet conventional roughness parameters are insufficient predictors of adhesion, friction, and wear. Thus, there is a need for re-examination of surface topography by the entire tribology community.

This plenary session will feature the **Worldwide Surface Topography Challenge**, where groups from around the world characterized the topography of the same surface. More than 150 tribologists participated, representing over 60 research groups and private companies from more than 20 countries. Together they contributed 2,000+ individual measurements. This session will present the results of this two-year international collaboration.

Initially, the submitted results revealed wide disagreement on conventional roughness parameters such as Ra; yet when processed using multi-scale techniques, a clearer consensus emerged. First, the results provide concrete guidance on advantages and disadvantages of 12 common surface-measurement techniques. Second, this challenge establishes the single most comprehensive description of a surface that has ever been performed. The public release of all data and analysis

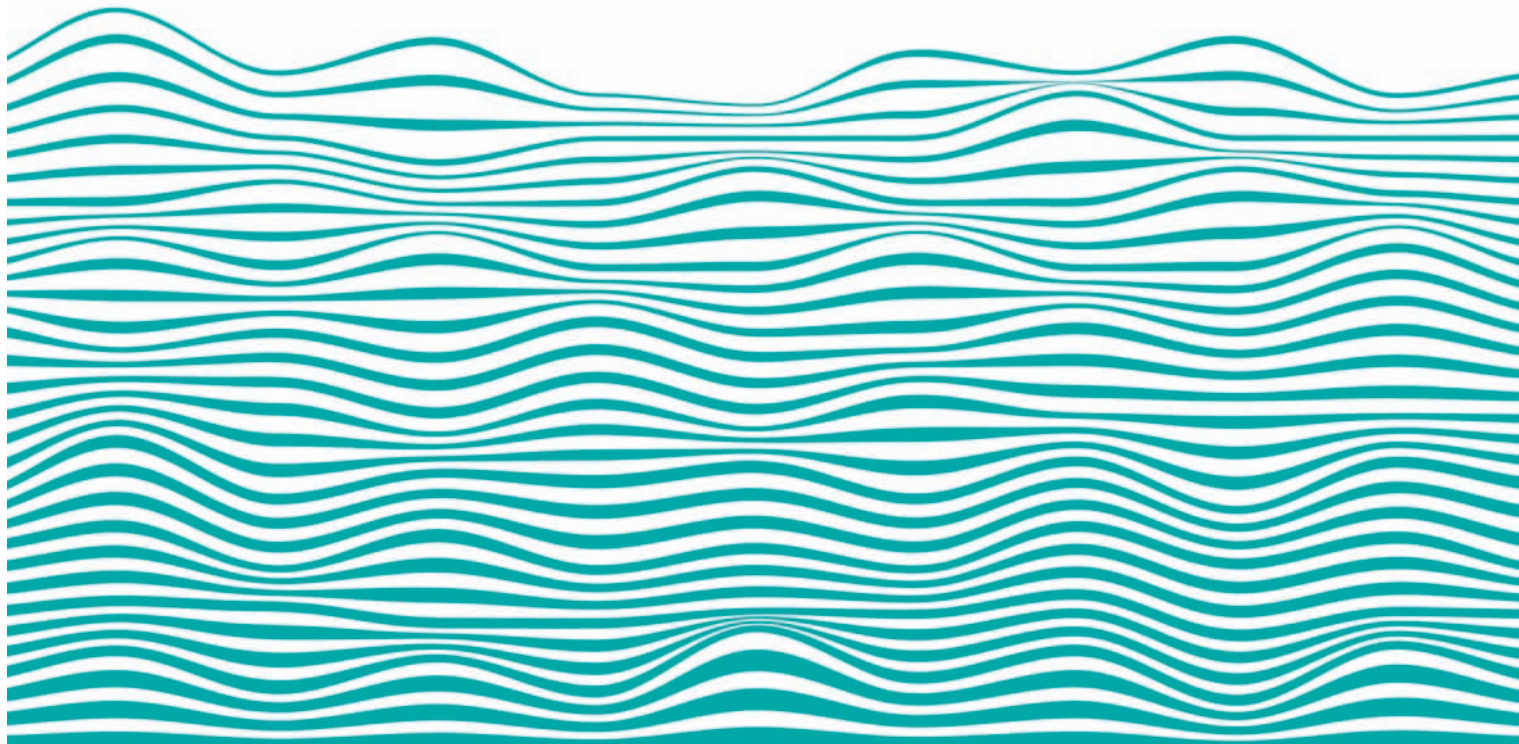
enables researchers and manufacturers across the entire tribology community to reuse, analyze, and benchmark against the results. Finally, these findings aid in the development of next-generation surface descriptors that better predict surface properties and can be used as manufacturing specifications to create better-performing products.



Session Organizer: Dr. Tevis Jacobs,

Associate Professor, Department of Mechanical Engineering and Materials Science, University of Pittsburgh

Tevis Jacobs is an associate professor in the department of mechanical engineering and materials science at the University of Pittsburgh. He received the CAREER award from the National Science Foundation (NSF) and holds two endowed fellowships at Pitt – the Whiteford Family Fellowship and the Innovation and Entrepreneurship Faculty Fellowship. He is an associate editor for the ASME Journal of Tribology and sits on the editorial boards of *Surface Topography: Metrology and Properties* as well as the STLE-affiliated journal, *Tribology Letters*. He is also the president and co-founder of *Surface Design Solutions*, which uses physics-informed machine learning to reduce costs in manufacturing.



2024 STLE Annual Meeting & Exhibition

Education courses and instructors

Please note all education courses are in the Minneapolis Convention Center.



The **2024 STLE Annual Meeting & Exhibition** features 11 industry-specific education courses offered on Sunday, May 19, Wednesday, May 22, and Thursday, May 23. The schedule is designed to give attendees more flexibility when planning their conference attendance. All courses are full day (start at 8:00 am and end by 5:00 pm). The half-day course runs from 1:00 pm until 5:00 pm. If you have not signed up for a course but would like to, please go to the STLE Registration Desk in the foyer of the Minneapolis Convention Center to check on availability.

Individuals will not be admitted to a course without registration.

Sunday, May 19

Advanced Lubrication 301: Advanced Additives | 200 E

Course Chair: Farrukh Qureshi, The Lubrizol Corporation

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, rheology and viscosity modifiers.

Modules and Instructors:

- **Antioxidants & Rust Inhibitors:** Kevin DeSantis, BASF
- **Detergents & Dispersants:** Alison Williamson, The Lubrizol Corporation
- **Antiwear, Extreme Pressure & Friction Modifiers:** Eugene Scanlon, BASF
- **Rheology & Viscosity Modifiers:** Timothy Smith, Lubrizol Ltd. (UK)

Who should attend: Engineers and scientists early/mid-career who want to brush up on their knowledge of lubricant additives. Lubricant additives provide several performance functions in the engine, transmission, gear, and electric vehicle systems.

Basic Lubrication 103 | 200 FG

Course Chair: Yvette Trzcinski, HF Sinclair

Basic Lubrication 103 is primarily for individuals entering the lubrication field who need 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 industry professionals attend

Education Courses | continued

the course to be kept up to date on the latest developments, especially in those areas not directly related to their job function or area of expertise. Thus, Basic Lubrication 103 is usually attended by a broad cross section of industry professionals such as technical, technical service, sales & marketing, maintenance, and managers who are involved in the industry. The course will focus on the fundamentals of lubrication associated with fluid and grease, as it applies to basic lubricated components such as gears and bearings. Also, the course includes a review of base stocks, synthetic lubricants and lab testing.

Modules and Instructors:

- **Lubrication Fundamentals:** Jake Finn, HF Sinclair
- **Base Oil Fundamentals:** Yvette Trzcinski, HF Sinclair
- **Additives:** Chris Schmid, The Lubrizol Corporation
- **Synthetics:** Tom Malinski, Chevron Phillips Chemical Co.
- **Fundamentals of Grease:** David Turner, CITGO Petroleum Corporation
- **Lubricant Tests:** Raymond Drost, Calumet Speciality Products Partners, L.P.

Who should attend: Lubricant Sales Personnel, Additive Sales, Lubricant/Additive Marketing, Lubricant Formulator or Manufacturer, Academia, Base Stock Sales or Manufacturer, Original Equipment Manufacturers (OEMs), Testing Equipment Manufacturers, Lubricant-Governing Associations.

Electric Vehicles 101 | 200 I

Course Chair: Carlos Sanchez, Southwest Research Institute (SwRI)

This course introduces hardware, tribology, lubrication, thermal management, and testing related to electric vehicles (EVs). It includes an overview of hybrid, fully battery and fuel-cell electric vehicles and covers the driveline systems of hybrid and full electric units. Other topics covered include lubricant, tribology and thermal management challenges and requirements for EVs and concludes with discussion about established test methods for EV fluid evaluation.



Modules and Instructors:

- **An Overview of Hybrid Full Electric and Fuel Cell Vehicles:** Peter Lee, Southwest Research Institute (SwRI)
- **Hardware Design and Drive Unit:** Peter Lee, Southwest Research Institute (SwRI)
- **Lubrication Requirements for Electric Vehicles:** Chris Cleveland, Afton Chemical Corporation
- **Lubricating Greases for Electric Vehicle Applications:** Gareth Fish, The Lubrizol Corporation
- **Heat Transfer and Thermal Management in HEV and EV:** Thomas Wellmann, FEV North America, Inc.
- **Test Methods for Evaluation of Electric Vehicle Fluids:** Rebecca Warden, Chevron Oronite & Harpal Singh, Solar Turbines

Who should attend: Students, engineers and scientists early/mid-career who are new to the electric vehicle industry or would like to brush up on fundamental knowledge of EV technologies and test methods.



Grease 101 (in partnership with NLGI) | 200 CD

Course Chair: Gareth Fish, The Lubrizol Corporation

This course is a comprehensive overview of all aspects of lubricating grease. Grease formulation components are thoroughly covered, including base oils and different thickeners types. Manufacturing technologies are reviewed, as well as grease testing significance and methods. Included is discussion detailing how to select the proper grease for different industrial and automotive applications and examples.

Modules and Instructors:

- **Introduction to Greases:** Gareth Fish, The Lubrizol Corporation
- **Base Oils:** Colby Goggans, Ergon, Inc.
- **Grease Manufacturing Overview & Open Kettle Manufacture:** David Turner, CITGO Petroleum Corporation
- **Grease Manufacturing Contractor/Kettle & Continuous Manufacture:** David Turner, CITGO Petroleum Corporation
- **Grease Testing:** Bob Cisler, Quaker Houghton

- **Automotive Applications:** Gareth Fish, The Lubrizol Corporation
- **Industrial Applications:** David Turner, CITGO Petroleum Corporation
- **Grease Selection:** Casey Budd, Lubrication Engineers Inc.

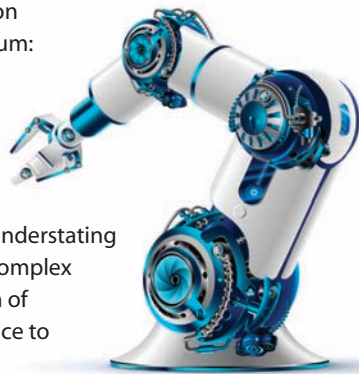
Who should attend: Engineers and scientists early/mid-career involved in lubricating grease sales and marketing, lubricating grease manufacturing, base oils or academia who want to brush up on their knowledge of lubricating greases. Users such as original equipment manufacturers (OEMs), grease testing equipment manufacturers and others with an interest in learning about the basics of lubricating greases.

NEW! Machine Learning and Artificial Intelligence in Tribology | 200 B

Course Chair: Wilfred (Eddy) Tysoe, University of Wisconsin-Milwaukee

Please note this is a half-day course only!

This new course will include hands-on activities with the following curriculum: designing and organizing database for use in tribology; orchestrating data for machine learning; the data pipeline in tribology; the use of physics-based machine learning – advancing fundamental understanding and simplifying the calculations of complex tribological systems; and application of machine learning/artificial intelligence to tribology (case studies).



Modules and Instructors:

- **Introduction to Machine Learning and Artificial Intelligence:** Prathima Nalam, SUNY University at Buffalo
- **Big Data as a Building Block for Extensible and Reliable Machine Learning:** Nick Garabedian, Karlsruhe Institute of Technology
- **Orchestrating Data for Machine Learning – The Data Pipeline in Tribology:** Max Marian, Pontificia Universidad Catolica De Chile
- **Application of ML/AI to Tribology – Case Studies:** Wilfred (Eddy) Tysoe (Moderator), University of Wisconsin-Milwaukee

Who should attend: Those in the industry who want to learn whether to use machine learning in their industry and how to accomplish this, and for tribology students wanting to learn how to incorporate into their research. The prerequisite for the course is an understanding of the basic principles of tribology, but a knowledge of MATLAB or Python programming would be useful.

Metalworking Fluids 105: Introduction to Metal Forming Fluids | 200 H

Course Chair: Jennifer Lunn, FUCHS Lubricants Company

Metalworking Fluids is designed for those involved in developing, working with, and using metal forming fluids in the manufacturing environment. Metalworking Fluids 105 is 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 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.

Modules and Instructors:

- **Introduction of Processes, Applications and Fluid/Lubrication Requirements:** Ben Faber, The Lubrizol Corporation
- **Metal Forming Lubricant Basics – Stamping and Blanking:** Jennifer Lunn, FUCHS Lubricants Company
- **Metal Forming Lubricant Basics – Rolling, Heading and Wire Drawing:** Ted McClure, Sea-Land Chemical Company
- **Metal Forming Failure Mechanisms – Lubrication, Concentration Control, Compatibility and Filtration:** Stephanie Velez, Münzing
- **Metal Forming Fluid Failure Mechanisms – Water Quality, Corrosion, Foam, Emulsion Size, Residue and Cleanability:** Stephanie Cole, Münzing
- **Controlling Contamination and Microbial Growth in Metal Forming Fluids:** Nicole Clarkson, Barentz North America, LLC & Clayton Cooper, Tower Metalworking Fluids
- **Waste Treatment of Metal Forming Fluids:** Zach Magness, Calvary Industries, Inc.
- **Operator Acceptance and Final Course Discussion:** TBA

Who should attend: Engineers, scientists, and other personnel early/mid-career involved in metal forming formulating, manufacturing, technical service, shop floor services, coolant service, sales, and marketing. Attendees can be from base oil suppliers, additive suppliers, independent lubricant manufacturers, academia, original equipment manufacturers (OEMs), and testing equipment manufacturers, or others with an interest in learning about the basics of metal forming processes and lubricants.

Wednesday, May 22

Advanced Lubrication 302: Advanced Lubrication Regimes | 200 F

Course Chair: Weixue Tan, ExxonMobil Research & Engineering Co.

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.

Modules and Instructors:

- **Lubrication Regimes:** Kuldeep Mistry, Chevron Oronite
- **Wear & Wear Mechanisms:** Ramoun Mourhatch, Chevron Oronite
- **Lubricant Failure:** Michael Blumfield, ExxonMobil Technology & Engineering Co.
- **Failure Analysis – Gears:** Stephen Berkebile, US Army Research Laboratory
- **Failure Analysis – Bearings:** Daniel Merk, Schaeffler Technologies AG & Co. KG
- **Failure Analysis – Automotive Engines:** Peter Lee, Southwest Research Institute (SwRI)

Who should attend: Lubricant Sales Personnel, Additive Sales, Lubricant/Additive Marketing, Lubricant Formulator or Manufacturer, Academia, Base Stock Sales or Manufacturer, Original Equipment Manufacturer (OEM), Testing Equipment Manufacturer, Lubricant-Governing Associations.

NEW! Auto/Diesel, Gasoline, Hydrogen and Ammonia | 200 J

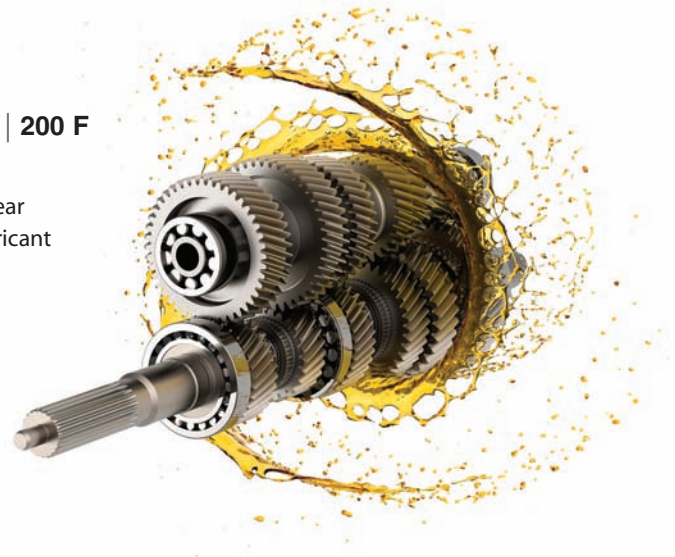
Course Chair: Peter Lee, Southwest Research Institute (SwRI)

This course provides an overview of engine and drivetrain systems and lubrication requirements for internal combustion engines (Diesel, Gasoline, Hydrogen and Ammonia) and drivelines. The course will also look at engine oil qualification, fuel requirements and friction and wear testing of engine components.

Modules and Instructors:

- **Engine and Transmission Hardware Overview:** Peter Lee, Southwest Research Institute (SwRI)
- **Bearings for Engines and Drivelines:** William Hannon, The Timken Company
- **Driveline Fluids:** Hamed Eskiri, Chevron Oronite
- **Basics of Engine Oils:** William Anderson, Afton Chemical Corporation
- **Engine Oil Testing:** Khaled Reiss, Shell
- **Cylinder Bore Design Considerations and Materials:** Hamed Ghaednia, Gehring L.P.
- **Ring-Liner:** Lake Speed, Jr., Total Seal Piston Ring
- **Friction and Wear Testing of Engine Components:** Georg Plint, Phoenix Tribology Ltd.

Who should attend: Industry professionals working with internal combustion engines or formulating testing oils.



Metalworking Fluids 240: Metalworking Fluid Formulation Concepts | 200 H

Course Chair: Kevin Saunderson, BP Lubricants USA, Inc.

This course is in response to many students of our other MWF courses who asked for a course on how to formulate. Metalworking Fluids 240 begins with some universal formulating basics such as experimental design, order of additions for ingredients, and considerations when scaling up from beakers to large blending tanks. Also covered will be base stocks, performance additives, emulsifier selection, HLB, qualification tests, optimization for stability both in the drum and in use, bioresistance, microbicide selection and use, and recalcitrant functional additives. Instructors will then discuss formulating for disposability and for global distribution. A panel discussion with all instructors will complete the course. While several examples of formulations will be presented throughout the sessions, this course will not be providing specific ready-to-use commercial formulations.

Modules and Instructors:

- **Universal Concepts:** Bridget Dubbert, Engineered Lubricants Company
- **Base Stocks and Performance Additives:** Karen Harrington, FUCHS Lubricants Company
- **Minimizing MWF Biodeterioration Risk:** Fred J. Passman, BCA, Inc.
- **Optimizing MWF Stability In-Drum and In-Use:** Michael Stapels, Kao Chemicals GmbH
- **Formulating for Global Distribution:** Neil Canter, Chemical Solutions
- **Formulating for Disposability:** John Burke, Consultant

Who should attend: Metalworking Fluid Formulators, MWF Compounders – Technical Service and Laboratory Personnel, Technical Sales and Marketing Personnel, Health & Safety or Environmental Affairs Personnel, individuals who have taken STLE's 105/115 level education courses or STLE 2½-day Metalworking Fluid Management Program.



Sustainability: Biolubricants & Biofuels | 200 G

Course Chair: Brajendra K. Sharma, USDA/ARS/ERRC

This course provides an overview of current progress in the development and use of biofuels and biolubricants. Course modules include an introduction to energy and alternative fuels, basic chemistry of biofuels and biolubes, general performance requirements, overview of market progress, niche markets, sustainability, and governmental and regulatory drivers. Products currently in various stages of commercialization will be discussed and information on European, US and OEM views will be included. The course primarily focuses on biolubricants, but includes a general overview of alternative transportation fuels, biofuel feedstocks, production, and quality issues.

Modules and Instructors:

- **Introduction to Biofuels and Biolubricants:** Brajendra K. Sharma, USDA/ARS/ERRC
- **Sustainability – A Balancing Act Between Marketing and Science:** Michael Stapels, Kao Chemicals GmbH
- **Sustainability – Drivers & The PCF Methodology Development:** Inga Herrmann, Ergon International Inc.
- **Chemistry 101 – Petroleum and Biobased Lubricants:** Selim Erhan, Process Oils
- **Chemistry 101 – Petroleum and Biobased Fuels:** Daniel Garbark, American Electric Power
- **Growth of Niche Markets in the US:** Larry Beaver, RSC Bio Solutions
- **Biofuel & Biolubricant Developments and Markets in the EU:** Stephen Baumagaertel, Verband Schmierstoff – Industrie (VSI) E.V.
- **Alternative Biofuel Quality and the Impact on Vehicle Performance and Emissions:** Alex Kulinowski, Afton Chemical Corporation & Jill Cummings, General Motors Corporation
- **Biofuels and Other Alternative Transportation Fuels:** Daniel Garbark, American Electric Power

- **Biodegradation, Regulations and Standards:** Neil Canter, Chemical Solutions
- **USDA Biolubricant Programs:** Sevim Erhan and Brajendra K. Sharma, USDA/ARS/ERRC

Who should attend: Students, engineers, scientists early/mid-career, lubricant formulators.

Thursday, May 23

NEW! Electric Vehicles 202 | 200 FG

Course Chair: Carlos Sanchez, Southwest Research Institute (SwRI)

The Electric Vehicle (EV) 202 course will discuss more advanced topics related to electric vehicle research and development. This course will cover current trends of EV technology and testing, fluid development, and tribological challenges.

Modules and Instructors:

- **EV Driveline Components:** Troy Muransky, American Axle & Manufacturing
- **Foaming and Aeration:** Safia Peerzada, Münzing
- **EV Batteries:** Thomas Wellmann, FEV North America, Inc.
- **Modeling and Simulation for EVs:** Hannes Grillenberger, Schaeffler Technologies AG & Co. KG
- **Energy Efficiency in EV:** Hitesh Thaker, Inflneum USA L.P.
- **E-Fluid Development:** Mariam Shamszad, The Lubrizol Corporation

Who should attend: Engineers and scientists early/mid-career who are familiar with or are currently working on electric vehicle technology and research.



Award recipients

STLE would like to congratulate the following individuals who will be recognized for their outstanding technical achievements in the field of tribology and lubrication during the 2024 STLE Annual Meeting & Exhibition.

Publishing awards are given in recognition of outstanding achievement in the field of tribology and lubrication. All publishing awards are for papers printed in **Tribology Transactions**, STLE's peer-reviewed journal.

Edmond E. Bisson Award

The Bisson Award was named in honor of Edmond E. Bisson, a former STLE editor-in-chief who was instrumental in establishing the society's reputation as a technical publisher. Established in 1991, the award is given to STLE members or non-members for the best written contribution published by the society in the year preceding the Annual Meeting. The contribution must deal with tribology, lubrication engineering or allied disciplines.

- **Xue Han**, Oakland University/Jilin University (USA/P.R. China)
- **Zhenpu Zhang**, Oakland University (USA)
- **Bo Pang**, Oakland University (USA)
- **Gary C. Barber**, FSTLE, Oakland University (USA)
- **Jianxin Zhao**, Oakland University (USA)
- **Feng Qiu**, Oakland University/Jilin University (USA/P.R. China)

"The Effect of Shot-Peening Time on Tribological Behavior of AISI160 Steel"

Frank P. Bussick Award

The Bussick Award is presented for the most outstanding technical paper written on sealing systems technology and materials. The award is sponsored by the STLE Seals Technical Committee and honors a former committee chair and STLE board member.

- **Defa Wu**, Huazhong University of Science and Technology (P.R. China)
- **Yunxiang Ma**, Huazhong University of Science and Technology (P.R. China)
- **Zhenyao Wang**, Huazhong University of Science and Technology (P.R. China)
- **Hao Min**, Huazhong University of Science and Technology (P.R. China)
- **Yipan Deng**, Huazhong University of Science and Technology (P.R. China)

- **Yinshui Liu**, Huazhong University of Science and Technology (P.R. China)

"Numerical and Experimental Study of Reciprocating Seals in Seawater Hydraulic Variable Ballast Components for 11,000-m Operation"

Walter D. Hodson Award

The Hodson Award was established in 1950 and is given to the lead author of the best paper written by an STLE member 35 years of age or younger and published by the society in the year preceding the Annual Meeting. The purpose of the award is to stimulate the interest of young engineers in the science of tribology and lubrication and the activities of STLE.

- **Saeed Aamer** (lead author), Purdue University (USA)
- **Farshid Sadeghi**, FSTLE, Purdue University (USA)
- **Thomas Russell**, Purdue University (USA)
- **Wyatt Peterson**, Purdue University (USA)
- **Andreas Meinel**, Schaeffler Technologies AG & Co. KG (Germany)
- **Hannes Grillenberger**, Schaeffler Technologies AG & Co. KG (Germany)

"Lubrication, Flow Visualization, and Multiphase CFD Modeling of Ball Bearing Cage"

Wilbur Deutsch Memorial Award

The Deutsch Award is named for a former STLE president and recognizes the most outstanding technical paper written on the practical aspects of lubrication published by the society in the year preceding the Annual Meeting.

- **Rachel Januszewski**, Imperial College London (United Kingdom)

- **Victor Brizmer**, SKF Research and Technology Development (The Netherlands)

- **Amir Kadiric**, Imperial College London (United Kingdom)

"Effect of Lubricant Properties and Contact Conditions on False Brinelling Damage"

Captain Alfred E. Hunt Award

Named for ALCOA's first president, this award is given annually to the STLE member or members authoring the best technical paper dealing with the field of lubrication or an allied field.

- **Scott Beamish**, University of Sheffield (United Kingdom)
- **Rob S. Dwyer-Joyce**, University of Sheffield (United Kingdom)

"Experimental Measurements of Oil Films in a Dynamically Loaded Journal Bearing"

Al Sonntag Award

The Sonntag Award was established in 1983 and is given to an STLE member or members authoring the best technical paper on solid lubricants published by the society in the year preceding the Annual Meeting.

- **Nankai He**, Jiangxi University of Science and Technology (P.R. China)
- **Jin Xiao**, Jiangxi University of Science and Technology (P.R. China)
- **Xiubo Chen**, Jiangxi University of Science and Technology (P.R. China)
- **Shengguo Zhou**, Jiangxi University of Science and Technology (P.R. China)

"Effect of Heat-Treatment Temperature on the Tribological Properties of WC-12Co-Reinforced Ni-Based Coating"

(continued on page 28)



A dedicated Technical Center for assisting our industry partners

The guiding philosophy of Azelis Americas' L&MF US Technical Center in Princeton, NJ is: "Take a technical challenge and help make it a commercial success for our customers and principles." To implement this philosophy, we work closely with an applications experienced team of internal and external Industry experts to address the needs of our customers with a suite of specialty products from premier suppliers. Azelis Americas' L&MF US Technical Center looks forward to working with you to achieve success on the bench and in the marketplace.



INDUSTRIES SERVED

- Lubricants • Metalworking
- Grease

LAB TESTING

- RPVOT • PDSC • Four Ball Wear • Four Ball EP • Hydrolytic Stability
- Kinematic Viscosity • Total Acid Number • TAN & Total Base Number (TBN)
- Copper Corrosion • Cast Iron Chip Corrosion • Roll Stability (grease)
- Cone Penetration (grease) • FT-IR Spectroscopy • Moisture Content, Karl Fischer
- Formulation Assistance • General Technical Service

**Innovation
through
formulation**

visit AzelisLMF-US.com



Industry Service Award Recipients

STLE International Award



Dr. Shigeo Shimizu, FSTLE,
Meiji University (Japan)

The International Award, which was established in 1948, is STLE's highest technical honor and bestows lifetime honorary membership on the recipient, who need not have been a member of STLE. It is given in recognition of the recipient's outstanding contributions in tribology, lubrication engineering or allied fields.

P.M. Ku Meritorious Award



Maureen Hunter, King
Industries, Inc. (USA)

The Ku Award was established in 1978 and is given to the STLE member who most typifies the dedicated spirit of the late P.M. Ku, who worked tirelessly to promote and advance the mission of STLE. The award has been established to recognize outstanding and selfless achievement on behalf of STLE. To qualify for the honor, the recipient must have been a member of the society for at least 15 consecutive years and performed extensive active, dedicated service.

Vic Joll Award



Peter Drechsler, FSTLE,
Proven Solutions Developed
LLC, STLE Canton Section
(USA)

The Vic Joll Award recognizes outstanding and selfless contributions by a member of an STLE local section. It is given to a section member who has worked tirelessly and continuously for the benefit of the section, devoting numerous hours in the performance of many tasks necessary to promote and advance the mission of the section and of STLE. The award is named in honor of the late Vic Joll, 1978-79 STLE president who championed local sections.

Outstanding STLE Local Section Awards

- STLE Chicago Section
- STLE Northern California Section

Raymond L. Thibault Excellence in Education Award



Doug Sackett, CLS,
TotalEnergies USA, Inc. (USA)

The Raymond L. Thibault Excellence in Education Award was established in 2020 and is given to an STLE member who has demonstrated dedication to passionate and influential work as an educator in practical aspects of tribology and lubrication engineering which benefits the STLE community.

2024 STLE Fellows

STLE Fellows are persons of outstanding personal achievement in the field of tribology or lubrication engineering who have 20 years of active practice in the science and/or engineering professions and have been an STLE member for 10 years. Individuals are nominated by the Fellows Committee and approved by the STLE board of directors.



Dr. Noel Brunetière, FSTLE,
Institut Pprime – University
of Poitiers (France)



Dr. Azzedine Dadouche,
FSTLE, National Research
Council Canada (Canada)



Dr. Mark Devlin, FSTLE,
Afton Chemical Corporation
(USA)



Dr. Ryan Evans, FSTLE,
The Timken Company
(USA)



Dr. Piet Lugt, FSTLE, SKF
Engineering & Research
Centre B.V. (The
Netherlands)

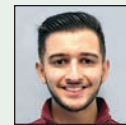
Student Scholarships

Presidential Awards Program

STLE grants three academic awards through its Presidential Awards Program: The Elmer E. Klaus Fellowship (graduate students), The E. Richard Booser Scholarship (undergraduate students) and The Jeanie S. Scholarship (female undergraduate or graduate students). These awards are administered by the STLE Presidential Council and are meant to encourage students to pursue an advanced degree or a career in tribology or lubrication engineering by subsidizing a research project related to the field.



**The Elmer E. Klaus
Fellowship:**
Seungjoo Lee, Texas A&M
University (USA)



**The E. Richard Booser
Scholarship:**
Yahya Qureshi, The
University of Akron (USA)



**The Jeanie S. McCoy
Scholarship:**
Miranda Boyd, The
University of Akron (USA)

Early Career Awards

This award recognizes the technical achievements of STLE student members, postdoctoral researchers, junior-level academic faculty & industry professionals and provides financial support for attendance to the STLE Annual Meeting.



Student
Takeru Omiya, University
of Coimbra (Portugal)



Postdoctoral Researcher
Behnoosh Baboukani,
University of California,
Berkeley (USA)



Academic Professional
Dr. Angela Pitenis,
University of California,
Santa Barbara (USA)



Industry Professional
Dr. Mary E. Makowicz,
Pratt & Whitney (USA)