



## 79th STLE Annual Meeting & Exhibition

### ***Nanotribology***

#### **CALL FOR ABSTRACTS**

**May 18-22, 2025, at Hyatt Regency Atlanta, Atlanta, Georgia (USA)**

Dear Friends and Colleagues,

The **Nanotribology Technical Committee** is excited to invite you to present your groundbreaking research at the Nanotribology technical sessions of the **79th STLE Annual Meeting & Exhibition** – a premier event for the tribology and lubricants communities. At STLE 2025, like last year, we will also host a joint session with the Materials Tribology technical committee on Tribochemistry, showcasing cutting-edge research in this emerging field. We encourage submissions that offer fundamental mechanistic insights into tribological phenomena.

This year's conference features 20-minute podium presentations and a vibrant student poster competition. Selected talks will be 40 minutes long. Submit your abstracts to the Nanotribology sessions through STLE's online abstract submission portal: <https://stle2025.abstractcentral.com/>. Abstracts will be peer-reviewed, with acceptance based on content and overall program balance. Remember to indicate **Nanotribology** or the appropriate joint session as your topic during submission. The deadline for submission is **Tuesday, October 1, 2024**. We welcome late abstract submissions, but their inclusion in the program is contingent on slot availability..

## **Nanotribology Technical Session**

The Nanotribology sessions will explore aspects of friction, wear, and adhesion between materials at atomic and nanometer length scales, using direct and semi-direct experimental methods or computational techniques. Specific topics include, but are not limited to:

### **Nanotribology Fundamentals**

- Mechanisms for friction, wear, and adhesion at the atomic and nanoscale
- Structure-property relationships derived from nanoscale mechanics
- Nanoscale surface metrology and contact mechanics
- Models for describing nanoscale contact, friction, and wear
- Nanotribology in extreme environments
- Relating nanotribology experiments and simulations
- Confinement effects on friction, wear, and adhesion
- Nanotribology of 2D Materials
- Superlubricity

### **Applied Nanotribology**

- Scale dependence and issues in bridging nano and macroscale tribology
- Tribology in nanomechanical or electromechanical devices; wear and reliability issues in nanotribology
- Tip-based manufacturing; nanolithography
- Synthesis, formulation, and performance of nanostructures (nanoparticles, nanorods, nanosheets) for tribology
- Recent advancements in aqueous and ionic lubrication
- Nanotribology of novel lubricants for electrified systems
- Material transformation and manipulation at the nanoscale

### **Methods in Nanotribology**

- In-situ instrumentation and measurement techniques
- Novel methods of simulating nanotribological contacts and behavior; simulation techniques
- Novel microstructural, mechanical, or chemical characterization techniques
- Advances in conventional experimental techniques

- Machine learning methods for understanding friction, wear, and lubrication
- Other novel methods

Please feel free to forward this to colleagues who might be interested in the Nanotribology sessions. For all questions on the Nanotribology Session, contact Arnab Neogi at [aneogi2@lanl.gov](mailto:aneogi2@lanl.gov). We look forward to seeing you in Atlanta!

Best Regards,

Arnab Neogi  
Paper Solicitation Chair  
Los Alamos National Laboratory

Cangyu Qu  
Vice Paper Solicitation Chair  
University of Pennsylvania

Pranjal Nautiyal  
Committee Vice Chair  
Oklahoma State University

Mehmet Z. Baykara  
Committee Chair  
University of California Merced

### **Joint Session on Tribochemistry**

In this joint session of the Materials Tribology and Nanotribology technical committees, we aim to highlight research on chemical reactions at the contact interface initiated or accelerated by

mechanical stresses. We encourage experimental and simulation studies, as well as investigations linking the two. Remember to select “**Tribochemistry Joint Session**” as your topic when submitting your abstract.

Suggested topics include, but are not limited to:

- Tribochemistry of metals, ceramics, nanoparticles, nanocomposites, and other advanced materials.
- Molecular mechanisms involved in friction-induced chemical reactions and lubrication.
- Chemical bonding at the sliding interface and its contribution to adhesion, friction, and wear.
- Physicochemical phenomena during interfacial shear and the control of intercalated products.
- Mechanochemistry of lubricant additives.
- Tribofilm formation and degradation, and the combined effect of mechanical stress and chemical reactions.
- Theoretical modeling of mechanical stresses at the sliding interface and their effect on interfacial chemistry and wear.
- Nanoscale mechanisms for chemically-assisted wear.

Cangyu Qu

Co-chair Tribochemistry Joint Session



We look forward to your participation and the exciting discussions that will follow. Let's make **STLE 2025** a memorable and impactful event!