



NANOTRIBOLOGY SESSIONS CALL FOR PAPERS

The Nanotribology technical committee invites you to present your research at the **Nanotribology technical sessions** of the 72nd STLE Annual Meeting & Exhibition, the premier event for the tribology and lubricants communities. At STLE 2017, the Nanotribology technical committee will also organize **two joint sessions** with the Materials Tribology and Lubrication Fundamentals technical committees which together aim to showcase cutting edge research in fundamental and applied nanotribology. The Nanotribology committee strongly encourages research presentations which provide fundamental, mechanistic insights into observed tribological phenomena.

You may submit an abstract (not exceeding 150 words) to the Nanotribology sessions through STLE's online abstract submission portal: <https://stle2017.abstractcentral.com/>. Remember to indicate Nanotribology or the appropriate Nanotribology joint session as your topic during the abstract submission process. Please note that the deadline for submission is **Saturday, October 1st, 2016**.

We are currently soliciting the following topics for the Nanotribology technical sessions and joint sessions:

Nanotribology technical sessions

Interfacial contact and relative motion is inherently complex and typically involves deformation at the nanoscale, as well as stress-assisted chemical reactions and atom transfer at or across the sliding interface. Nanotribology is the study of friction, wear and adhesion at the atomic and nanometer length-scales (<100 nm) and utilizes either direct or semi-direct observation or simulation of these nanoscale phenomena. Nanotribology also involves studying the effects of nano-structures with an emphasis on elucidating their mechanisms for enhancing performance at the macroscale. The goal of such investigation is to obtain an understanding of physical and chemical processes at fundamental length-scales which can enable development of predictive models and transfer nanoscale phenomena to real engineering applications and systems. Nanotribology sessions cover, but are not limited to the following topics:

1. Nanotribology Fundamentals:

- Friction, wear and adhesion at the atomic and nano scale
- Structure-property relationships derived from nanoscale mechanics and tribochemistry
- Mechanisms of nanoscale lubrication and wear; superlubricity
- Nanoscale surface metrology and contact mechanics
- Models for describing nanoscale contact, friction and wear
- Nanotribology in extreme environments
- Relating nanotribology experiments and simulations
- Friction, wear and adhesion of nanomaterials

2. Applied Nanotribology:

- Applications of nanostructures in tribology: Nanoparticles, nanorods, nanosheets
- Scale dependence and issues in translating nanoscale tribology to the macroscale
- Tribology in nanomechanical or electromechanical devices; reliability issues in nanotribology
- Tip-based Manufacturing; nanolithography
- Synthesis, Formulation and Performance of nanostructures for tribology;
- Nanotribology of soft matter – interfacial mechanics, lubrication and mechanochemistry; nanotribochemistry
- Material transformation and manipulation at the nanoscale

3. Methods and Techniques in Nanotribology:

- *In-situ* instrumentation and measurement techniques
- Novel methods of simulating nanotribological contacts and behavior; simulations techniques
- Novel microstructural, mechanical or chemical characterization techniques

- Advances in conventional experimental techniques
- Other novel Methods

Nanotribology-Lubrication Fundamentals joint session: Nanoparticle Additives and Interactions

The Nanotribology technical committee is also soliciting papers for a joint session on *Nanoparticle Additives and Interactions* in partnership with the Lubrication Fundamentals technical committee. At this joint session, we will highlight research focusing on the fundamental understanding of nanoparticle additives and their interactions with different base stock as well as co-additives. Where applicable, an emphasis on scale-drive benefits and drawbacks of nanoparticle additives over their conventional-form analogues, as well as other conventional additives is strongly encouraged.

Topics of research being accepted to this track include, but are not limited to:

- Novel material chemistries as lubricant nanoparticle additives
- Interactions of nanoparticle additives with legacy as well as advanced lubricant base stocks
- Interactions of nanoparticle additives with lubricant co-additives such as friction modifiers, anti-wear additives, detergents, dispersants, anti-oxidants, etc.
- Interactions of nanoparticles with surfaces and surface coatings
- Novel nanoscale and macroscale experimental methods for elucidating lubrication mechanisms of nanoadditive lubricants
- Nanomechanical and tribochemical analysis of interfacial films derived from nanoparticle additives
- Translating performance of nano-additive lubricants from fundamental length-scales to component-scale interfaces

Nanotribology – Materials Tribology joint session: Tribochemistry

The technical committees in Nanotribology and Materials Tribology are excited to announce a joint session focused on *Tribochemistry*. In this joint session, we would like to highlight research that focuses on chemical reactions at the contact interface that are initiated or accelerated by mechanical stresses. We encourage experimental and simulation studies as well as investigations that link the two. Suggested topics within this focus area include, but are not limited to:

- Chemical bonding across the interface and its contribution to adhesion, friction, and wear
- Atomistic mechanisms of material removal during sliding wear
- The formation or degradation of tribofilms via mechanical stress and chemical reactions
- Experiments aimed at understanding fundamental mechanisms in tribology, including *in-situ* and *in-vivo* testing
- Analytical modeling of mechanical stresses at interfaces and their effects on chemistry
- Atomistic and multi-scale simulations of atomic-scale reactions at interfaces

Please feel free to forward this to your colleagues who might be interested in the Nanotribology sessions. We look forward to seeing you in Atlanta!

Sincerely,
Harman Khare, Ph.D.
hkhare@seas.upenn.edu
Nanotribology Paper Solicitation Chair

Philip Egberts, Ph.D.
pgsegber@ucalgary.ca
Nanotribology Paper Solicitation Vice-Chair &
Co-Chair for the joint session *Tribochemistry*

Zhijiang Ye, Ph.D.
zye@umiamioh.edu
Nanotribology Paper Solicitation Vice-Chair &
Co-Chair for the joint session *Nanoparticle Additives and Interactions*