

Society of Tribologists and Lubrication Engineers (STLE) 76th Annual Meeting & Exhibition



Nanotribology CALL FOR ABSTRACTS

15-19 May, 2022, at Walt Disney World Swan & Dolphin in Orlando, Florida (USA)

Dear Friends and Colleagues,

The Nanotribology technical committee invites you to present your research at the **Nanotribology technical sessions** of the 76th STLE Annual Meeting & Exhibition – a premier event for the tribology and lubricants communities, currently planned to return to its in-person format. At STLE 2022, the Nanotribology technical committee will also organize *two joint sessions* with the Materials Tribology technical committee and *one joint session* with the Biotribology technical committee, which together aim to showcase cutting edge research in fundamental and applied nanotribology. The Nanotribology committee strongly encourages research presentations that provide fundamental, mechanistic insights into observed tribological phenomena.

The format of the conference offers 30-minute podium presentations and a student poster competition. Highlighted invited speakers in our sessions, who have so far confirmed their participation, include Prof. Martin Dienwiebel and Prof. Ernst Meyer.

You may submit a short abstract to the Nanotribology sessions through STLE's online abstract submission portal: <https://stle2022.abstractcentral.com>. The abstracts will be peer reviewed and the acceptance will be based on the content and overall program balance. 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 **Friday, October 1st, 2021**.

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

Nanotribology Technical Session

The Nanotribology sessions will cover aspects of friction, wear, and adhesion between materials at atomic and nanometer length-scale, implemented by either direct and semi-direct experimental methods, or computer-simulation techniques. Specific topics include but are not limited to:

1. 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

2. 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 lubrication
- Nanotribology of novel surfactants for engine lubrication
- Material transformation and manipulation at the nanoscale

3. 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 your colleagues who might be interested in the Nanotribology sessions. For all questions on the Nanotribology Session, please contact Nick Garabedian at nikolay.garabedian@kit.edu. We look forward to seeing you in Orlando!

Best Regards,

Nick Garabedian

Paper Solicitation Chair (PSC), Karlsruhe Institute of Technology (KIT)

Mehmet Z. Baykara

Vice Paper Solicitation Chair and Tribochemistry Joint Session Co-Chair, University of California, Merced

Arnab Bhattacharjee

Vice Paper Solicitation Chair and 2D Materials Joint Session Co-Chair, University of Delaware

Arzu Çolak

Vice Paper Solicitation Chair and Biotribology at the Nanoscale Joint Session Co-Chair, Clarkson University

Mohammad Vazirisereshk

Committee Vice Chair, University of California, Merced

Prathima C. Nalam

Committee Chair, University at Buffalo

Joint Session on Tribochemistry

In this joint session of the Materials Tribology and Nanotribology technical committees, 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. Please remember to select “Tribochemistry Joint Session” as your topic when you submit your abstract. Suggested topics include, but are not limited to:

- Tribochemistry of metals, ceramics, nanoparticles, nanocomposites and other technologically advanced materials
- Molecular mechanisms involved in friction-induced chemical reactions and lubrication
- Chemical bonding occurring at the sliding interface and its contribution to adhesion, friction, and wear
- Physicochemical phenomena occurring during interfacial shear and the control of intercalated products
- Tribofilm formation and degradation and the compound 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

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Materials Tribology Technical Committee

Co-Chair, **Tribochemistry Joint Session**

Arnab Bhattacharjee

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Nanotribology Technical Committee

Co-Chair, **Tribochemistry Joint Session**

Joint Session on 2D Materials + Superlubricity

In this joint session of the Materials Tribology and Nanotribology technical committees, we would like to highlight research that focuses on 2D materials + Superlubricity (such as but not limited to metal dichalcogenides, graphene, h-BN, etc.) for tribological applications. We encourage experimental and simulation studies as well as investigations that link the two. Please remember to select “2D Materials Joint Session” as your topic when you submit your abstract. Suggested topics include, but are not limited to:

- Mechanistic interpretations of nanoscale tribological behavior of 2D material & links to macroscale behavior
- Impact of aging, degradation & environmental sensitivities of 2D materials on tribological behavior
- Simulations & modeling of interlamellar interactions in 2D materials
- Strain engineering studies & tuning of 2D material properties
- Understanding lamellar solids in the context of lamellar interactions
- Role of surface functionalization techniques for 2D materials on tribological behavior
- Advanced deposition techniques of 2D materials for tribological applications
- Macro- and nano- tribological behavior of 2D heterostructures

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Materials Tribology Technical Committee

Co-Chair, **2D Materials** Joint Session

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Nanotribology Technical Committee

Co-Chair, **2D Materials** Joint Session

Joint Session on Biotribology at the Nanoscale

The Biotribology and Nanotribology Technical Committees invite you and your colleagues to submit abstracts for the upcoming Biotribology at the Nanoscale session at the 76th Annual STLE Meeting and Exhibition at the Walt Disney World Swan and Dolphin in Orlando, Florida. *The session focuses on tribology mechanisms occurring on biological and biomimetic surfaces at atomic, molecular and nanometer length-scales.* Submissions may include experiments, simulation, and/or theory.

Presentations are normally 30 minutes, including Q&A.

Specific topics include, but are not limited to these:

- Natural nanoscale interfaces of import
- Tribology of materials including metals, alloys, ceramics, polymeric or organic materials at the nanoscale with biological relevance
- The nanoscale adhesion, friction and wear issues of biotechnology devices
- Friction, adhesion, lubrication mechanisms in biological systems at the molecular and nanoscale

Submit your abstract here: <https://stle2022.abstractcentral.com/> ➡ select “Biotribology at the Nanoscale” as your topic.

Podium abstract deadline: **October 1st, 2021**

Poster abstract deadline: **March 14th, 2022**

For all questions on the Biotribology session, please
contact Arzu Çolak at acolak@clarkson.edu

Alison C. Dunn, Biotribology at the Nanoscale Joint Session Chair

Arzu Çolak, Biotribology at the Nanoscale Joint Session Chair