



International Workshop

Contact Mechanics and Friction – Foundations and Applications

14.-17. October 2019

Venue: Main building of TU Berlin, room H 1035 and H 1036 (Senate meeting rooms),
Str. des 17. Juni 135, 10623 Berlin

Program

Sunday, October 13

Arrival of participants

Monday, October 14

08:00 – 18:00

Registration

08:45 – 09:00

Opening: Popov

Chair: Dae-Eun Kim

09:00 – 09:25

J. Fineberg (Israel), *Friction, Fracture and Earthquakes at the Interface of Sliding blocks*

09:25 – 09:50

C. Basdogan (Turkey), *Contact mechanics for electroadhesion*

09:50 – 10:15

J. Luo (China), *The new advances of superlubricity*

10:15 – 10:40

J. Krim (USA), *Electrotunable control of friction with nanoparticles at solid-liquid interfaces*

10:40 – 11:10

Coffee break

Chair: Jacqueline Krim

11:10 – 11:35

D.-E. Kim (Korea), *On fundamental understanding of friction*

11:35 – 12:00

D. Dini (UK), *Additives, lubricants and contact mechanics: Insights from molecular and multi-scale simulations*

12:00 – 12:25

M. Müser (Germany), *Modeling the highly non-linear contact mechanics of hydrogels*

12:25 – 12:50

E. Van der Heide (Netherlands), *Contacts in skin tribology*

12:50 – 13:00

Conference photo in the atrium of the university (in front of the meeting room)

13:00 – 14:30

Lunch

Chair: Jay Fineberg

14:30 – 14:55

K. Nakano (Japan), *Contact dynamics of self-beating cardiac cells*

14:55 – 15:20

L. Pastewka (Germany), *Contact and adhesion of rough surfaces*

15:20 – 15:45

M. Heß (Germany), *A macroscopic model for the electroadhesive frictional contact between the fingertip and touchscreen*

15:45 – 16:10

Q. Li (Germany), *Adhesive contact of rough surfaces*

16:10 – 16:35

Coffee break

Chair: Martin Müser

16:35 – 17:00

J.H. Horng (Taiwan), *Introduction to three-body mixed lubrication*

17:00 – 17:25

E.A. Kolubaev (Russia), *Friction stir processing as a method for structure and mechanical characteristics management for thermally hardened aluminum alloy*

17:25 – 17:50

A. Ruggiero (Italy), *Biotribology in arthroplasty: from in vitro to in silico wear prediction*

17:50 – 18:15

E. Willert (Germany), *Viscoelastic impact tests: What do we measure?*

Poster presentation in the Gallery in front of H 1035 from Monday, October 14 to Tuesday, October 15

Tuesday, October 15

- Chair: Daniele Dini
- 08:30 – 08:55 M. Khonsari (USA), *Application of irreversible thermodynamics for assessing degradation in mechanical components*
- 08:55 – 09:20 V. Aleshin (France), *Semi-analytical solutions in contact mechanics applied in acoustics and vibrations*
- 09:20 – 09:45 F. Borodich (UK), *Contact probing of prestressed adhesive membranes of living cells and cell-cell interactions*
- 09:45 – 10:10 M. Hirano (Japan), *Non-linear dynamical effects in frictional energy dissipation in atomistic friction model*
- 10:10 – 10:40** **Coffee break**
- Chair: Marco Paggi
- 10:40 – 11:05 G. Carbone (Italy), *The mechanics of steady and reciprocating viscoelastic moving contacts*
- 11:05 – 11:30 J. Scheibert (France), *Shear-induced evolution of contact morphology in rough elastomeric interfaces*
- 11:30 – 11:55 M. Kalin (Slovenia), *Submicron investigation of the multi-asperity contacts of real engineering surfaces: Experimental and theoretical analysis*
- 11:55 – 12:20 E. Ciulli (Italy), *Contact force measurements in lubricated cam-follower contacts*
- 12:20 – 12:45 R. Pohrt (Germany), *The paradox of large particles in Rabinowicz wear criterion*
- 12:45 – 14:15** **Lunch**
At the same time meeting of Editorial Board of *Frontiers in Mech. Eng.*
- Chair: Ken Nakano
- 14:15 – 14:40 I. Goryacheva (Russia), *Modelling of the cylinder deceleration dynamics on elastic and viscoelastic base*
- 14:40 – 15:05 J. Benad (Germany), *FFT-based Boundary Element Method for arbitrary shapes*
- 15:05 – 15:30 M. Paggi (Italy), *Advancements in finite element methods and in smoothed particle hydrodynamics for tribology*
- 15:30 – 15:55 M. Popov (Germany), *Contact mechanics of frictional drives and ratchets*
- 15:55 – 16:25** **Coffee break**
- Chair: Valentin Popov
- 16:25 – 16:50 Y. Tian (China), *Adhesion control based on peel zone model*
- 16:50 – 17:15 M. Ciavarella (Italy), *On some extensions and limitations of JKR theory of adhesion*
- 17:15 – 17:40 J. M. Martinez (Spain), *Functional polyurethane pressure sensitive adhesives with controlled tack in short temperature range*
- 18:00** **Reception in the atrium of the university** (in front of the meeting room)

Poster presentation in the Gallery in front of H 1035 from Monday, October 14 to Tuesday, October 15

Wednesday, October 16 (Building M, room M123!)

- Chair: Irina Goryacheva
- 09:00 – 09:25 V. Yastrebov (France), *Elasto-dynamic frictional contact at bi-material interfaces*
- 09:25 – 09:50 S. Ozaki (Japan), *Rate- and state-dependent friction model based on the elastoplastic theory*
- 09:50 – 10:10 N. V. Perepelkin (UK), *Analytical-numerical framework for the evaluation of physical properties of elastic structures*
- 10:10 – 10:30 S. Moreno-Flores (Austria), *Investigating the contact behaviour of biomolecular assemblies and living cells with hybrid microscopies*
- 10:30 – 11:00 Coffee break**
- Chair: Vlad Yastrebov
- 11:00 – 11:25 I. Argatov (Sweden), Y.S. Chai (Korea), *Contact geometry adaptation in fretting wear*
- 11:25 – 11:50 A. Tsukanov (Russia), *Nanoconfined water in the contact spot of hydrophilic and hydrophobic solids under high-pressure*
- 11:50 – 12:15 E. Shilko (Russia), *Non-linear mechanical response of fluid-saturated viscoelastic solids: influence of the competition between pore volume change and fluid filtration*
- 12:15 – 12:40 A. Dmitriev (Russia), *Molecular dynamics simulations of tension and nanoscratching of ultra-thin multi-component coatings to titanium substrates*
- 12:40 – 14:10 Lunch**
- Chair: Vladislav Aleshin
- 14:10 – 14:35 R. Balokhonov, V. Romanova (Russia), *Influence of metal matrix – ceramic particle interfacial adhesion on deformation and fracture of composites*
- 14:35 – 15:00 A. Dimaki (Russia), *Factors controlling adhesive wear: a theoretical study on a mesoscopic spatial scale*
- 15:00 – 15:25 A. Filippov (Ukraine), *Pattern formation in numerical modeling of biological problems*
- 15:25 – 15:55 Coffee break**
- Chair: Ruslan Balokhonov
- 15:55 – 16:20 I. Liashenko (Germany | Ukraine), *Influence of surfaces roughness on adhesive strength: experiment*
- 16:20 – 16:45 V.L. Popov (Germany), *Active bio contact mechanics*
- 16:45 – 17:00 **Information about publication of Workshop papers (Special Issue)**

Thursday, October 17 (Building M, room M123!)

- 09:00 – 10:30 Round Table**
- 10:30 – 12:00 Laboratory tour**
- 13:30 – 17:00 Small workshops**