

JUNE 30, TUESDAY

Room A

Morning Session

CHAIRPERSON D.A. INDEITSEV

10:10–10:20 OPENING CEREMONY

10:20–11:00 E.V. Lomakin. Constitutive equations of theory of elasticity for isotropic and anisotropic solids with variable deformation properties and solutions of problems

11:00–11:40 Y. Ueda. At the time when broken egg appeared

Coffee break

12:00–12:40 N.F. Morozov, A. Gruzdkov, Y. Petrov, L. Shikhobalov. Different approaches to explanation of thermal effect in dynamic yielding

12:40–13:20 A. Metrikine. Derivation of a dynamically consistent gradient elastic continua from a regular lattice: procedure, uniqueness, causality and applications

13:20–14:00 A.A. Mailybaev, A.P. Seyranian. Stabilization of statically unstable systems by parametric excitation

Evening Session

Minisymposium “Multiscale modelling”

CHAIRPERSON A.M. KRIVTSOV

15:30–16:00 A.L. Svistkov, A.G. Pelevin, A.A. Adamov. Structural-Phenomenological Modelling of Softening and Recovery of Mechanical Properties of Elastomer Nanocomposite

16:00–16:30 S.A. Timan. Modelling of the effect of adhesion strength on the mechanical response of particulate filled polymer under low-rate tension

16:30–17:00 A.V. Ankudinov, Yu.A. Kumzerov, G.V. Krokhaleva, O.S. Loboda. Investigations of mechanical properties of nanoobjects by means of scanning probe microscopy

17:00–17:20 V.A. Kuzkin, A.M. Krivtsov. Thermo-mechanical parameters for perfect crystals with arbitrary multibody potential

17:20–17:40 I.E. Berinskiy, A.M. Krivtsov. Description of mechanical properties of graphene based on different mathematical models

17:40–18:00 E. Podolskaya. Modeling and design of mechanical properties and structure of HCP lattice using pair potentials

18:00–18:30 Welcome party

Room B

Evening Session

CHAIRPERSON A.V. ZAITSEV

Computational mechanics

15:30–15:50 S.A. Lychev, V.A. Kovalev. Nonstationary vibrations of 3-layered viscoelastic plates

15:50–16:10 I. Paczelt, A. Baksa. Solution of the contact problems using p-extension finite elements

16:10–16:30 I. Brigadnov. The adaptive block relaxation method for ill-conditioned problems in plasticity and nonlinear elasticity

16:30–16:50 A. Shutov, R. Kreissig. Geometrical numerical integrators for finite strain viscoplasticity: Stability and convergence

16:50–17:10 E. Shilko, A.Yu. Smolin, S.V. Astafurov, S.G. Psakhie. An approach to modelling of elastoplastic continuum within the framework of discrete element approach

17:10–17:30 V.D. Sulimov, P.M. Shkapov. Hybrid algorithms applied to inverse spectral problems for hydromechanical systems

17:30–17:50 N. Vaganova. Numerical simulation of heat propagation from deepen pipeline with accounting filtration properties of soils

Room C

Evening Session

CHAIRPERSON S.A. LURIE

Phase transitions

15:30–15:50 S. Gavrilov, E. Shishkina. Dynamics of phase transformations in a spherical elastic body.

15:50–16:10 K.L. Muratkov, A.L. Glazov, V.I. Nikolaev, S.A. Pulnev. The influence of external loading and near surface defects on photo-acoustic images of Cu-Al-Ni alloys with shape memory effect

16:10–16:30 G.G. Tsypkin. Phase transitions in porous media

16:30–16:50 A. Freidin. Chemical reaction fronts in nonlinear elastic solids and a chemical affinity tensor

16:50–17:10 E. Vilchetskaya, A. Freidin. Modelling a chemical reaction front propagation in elastic solids: 1D case

17:10–17:30 N. Evstigneev, A. Knyazeva. Spreading of a solid-phase chemical reaction in a plate subjected to mechanical loading

17:30–17:50 N. Kizilova. Thermodynamic modelling of biological growth

JULY 1, WEDNESDAY

Room A

Morning Session

CHAIRPERSON A.M. KRIVTSOV

9:15 – 9:30 OPENING CEREMONY OF A JOINT SESSION WITH THE THIRD ADHESINT INTERNATIONAL WORKSHOP ON: "ADHESIVE INTERACTIONS BETWEEN PARTICLES AND SURFACES AT MICRO AND NANO-SCALES"

9:30 – 10:10 F.M. Borodich. Sticky problems of mechanics: from nanoindentation to plant-insect interactions

10:10 – 10:50 I.G. Goryacheva, Yu.Yu. Makhovskaya. Adhesion in sliding contact of viscoelastic bodies with rough surfaces

10:50 – 11:30 A. Castellanos. Fluidization of micro and nanoparticles: The role of interparticle and external forces

Coffee break

11:50 – 12:40 B.A. Galanov, I.K. Valieieva, S.M. Ivanov. Adhesion in sliding contact of rough elastic solids

12:40 – 13:30 J.A. Greenwood. The representation of molecular forces emanating within a body as surface forces

Evening Session

CHAIRPERSON E. PAVLOVSKAIA

15:00 – 15:40 M. Wiercigroch. Chaos in Underwater Acoustics

Break

Minisymposium "Chaos and complexity"

CO-CHAIRPERSONS E. PAVLOVSKAIA, M. WIERCIGROCH

15:50 – 16:10 E. Pavlovskaja, E. Sitnikova, M. Wiercigroch. Dynamics of the impact oscillator with pseudoelastic support

16:10 – 16:30 Q. Cao, R. Tian. Hopf bifurcations for the recent proposed SD oscillator

16:30 – 16:50 J. Ing, E. Pavlovskaja, M. Wiercigroch. A 2-sided piecewise linear oscillator and the effects of asymmetry: experiment and simulation.

Coffee break

17:10 – 17:30 K. Avramov. Nonlinear Dynamics of One Disk Rotors

17:30 – 17:50 T. Sapsis, G. Haller. Local instabilities along invariant manifolds, with applications to mechanics, fluids, and biology

17:50 – 18:10 V. Serebryakov. Some Problems of Drag Reduction for Motion in Water with Developed Cavitation

Room B

Evening Session

CHAIRPERSON E. VILCHEVSKAYA

Molecular and particle dynamics

15:50 – 16:10 E.F. Oleinik, S.N. Rudnev, O.B. Salamatina, M.I. Koteliyanskii. New Look on Plastic Deformation of Polymer and Metallic Glasses

16:10 – 16:30 A. Yanilkin, A. Kuksin, G. Norman, P. Zhilyaev. Molecular dynamics simulation of dislocation nucleation in aluminum

16:30 – 16:50 A. Kuksin, G. Norman, V. Stegailov, A. Yanilkin. Plasticity of Al and Al-Cu alloys under dynamic loading: atomistic simulation

Coffee break

17:10 – 17:30 N. Sharma. Synergy between Brownian motion and Radiation of Nanoparticle: How and Why?

17:30 – 17:50 S. Starikov. Mechanical properties of carbon nanotubes calculated by molecular dynamic method

17:50 – 18:10 E. Selivanova. Computer modelling for initiation and synchronization processes of oscillation of ciliated cells cilia

Room C

Evening Session

CHAIRPERSON F.M. BORODICH

The third ADHESINT International Workshop on: "Adhesive interactions between particles and surfaces at micro and nano-scales"

15:00 – 15:45 E.V. Teodorovich. On the mechanism of noncontact friction

15:45 – 15:50 Discussion.

15:50 – 16:25 S. Lurie. On a continual model of adhesive interactions in solids and some applications

16:25 – 16:30 Discussion.

Coffee break

16:50 – 17:35 L. Keer. Investigation of Particle Damping Mechanism via Particle Dynamics Simulations and Experiment

17:35 – 17:40 Discussion.

JULY 2, THURSDAY

Room A

Morning Session

CHAIRPERSON I.E. BERINSKIY

10:00–10:10 OPENING CEREMONY OF THE THIRD YOUNG SCIENTISTS' SCHOOL - CONFERENCE "MODERN WAYS IN MECHANICS (MWM) 2009"

10:10–10:50 **I. Sevostianov.** Cross-property connections for materials with microstructure

10:50–11:30 **N. Smirnov, V. Nikitin.** Mathematical models for two- combustion in streaming flows

Coffee break

CHAIRPERSON V. KUZKIN, M. ANTIMONOV

Posters presentations

11:50–12:00 **Opening ceremony**

12:00–14:00 **Posters presentations (PS1)**

21.00 **Banquet**

Room B

Evening Session

15:30–17:00 **MWM 2009 posters session (PS1)**

17:00–18:30 **APM 2009 posters session (PS2)**

Room C

Morning Session

CHAIRPERSON F.M. BORODICH

The third ADHESINT International Workshop

9:00–9:45 **K. Kendall.** Adhesion of nanoparticles; Formation of doublets

9:45–9:50 **Discussion.**

9:50–10:35 **G.G. Adams.** Experiments and Multiscale Modeling of Contact and Adhesion in a Microswitch

10:35–10:40 **Discussion.**

10:40–11:25 **A. Kovalev, N. Myshkin.** Phenomenological Description of Adhesion Effect in Contact Interaction of Solids

11:25–11:30 **Discussion.**

Coffee break

11:50–12:35 **M. Nosonovsky.** Capillary adhesion and surface roughness: the issues of sensitivity and stability

12:35–12:40 **Discussion.**

12:40–13:25 **R.W. Snidle, H.P. Evans.** Lubrication and Contact of Rough Surfaces : Past, Present and Future

13:25–13:30 **Discussion.**

Evening Session

CHAIRPERSON F.M. BORODICH

The third ADHESINT International Workshop

15:00–15:45 **Ile C. Gebeshuber, Burhanuddin Yeop Majlis .** Learning from Nature: Biomimetic adhesives

15:45–15:50 **Discussion.**

15:50–16:05 **F.M. Borodich, B.A. Galanov.** No-slip JKR theory of adhesive contact for generalized axi-symmetric punches

16:05–16:25 **F.M. Borodich, Yu. I. Prostov, S.N. Gorb.** Further development of the method for extracting adhesive properties of materials from data on compression

16:25–16:30 **Discussion.**

Coffee break

16:50–17:25 **Round Table Discussion.** Adhesive Interactions and Nanoscience

JULY 3, FRIDAY

Room A

Morning Session

CHAIRPERSON A.M. KRIVTSOV

10:10 – 10:50 Yu.D. Tretyakov.

10:50 – 11:30 A.M. Krivtsov. Morphology and mechanics of carbon nanostructures

*Coffee break
Morning Session*

CHAIRPERSON E. SHISHKINA

Nonlinear dynamics

11:50 – 12:10 N. Yaroshevich. Transition regimes in the inertia-excited afterresonant vibrational installations with several degrees of freedom of the carrier system

12:10 – 12:30 E. Mamedov. On the quasi-periodic perturbations of Duffing - Van-der-Pol equation

12:30 – 12:50 A. Kireenkov. Modeling of Dry Friction Effects in Conditions of Combined Kinematics

12:50 – 13:10 L.I. Manevitch, E.L. Manevitch. Limiting phase trajectories and secondary resonances in the nonlinear periodically oscillator

13:10 – 13:40 I. I. Blekhman, V.B. Vasilkov, K.S. Yakhimova, L.I. Blekhman, K.S. Ivanov, V.S. Sorokin. Vibration displacement induced by the elements deformability

Evening Session

CHAIRPERSON A.B. FREIDIN

Mechanics of media with microstructure

15:30 – 15:50 E. Ivanova. On one approach to formulation of coupled problems of thermoelasticity and thermoviscoelasticity

15:50 – 16:10 S.A. Lurie, D.B. Volkov-Bogorodskii, N.P. Tuchkova, P.A. Belov, V.I. Zubov. On continuous theory of adhesive interaction in solid mechanics. Applications in mechanics of materials with microstructures

16:10 – 16:30 E. Grekova. Interaction of translational and rotational subsystems in anisotropic Cosserat materials

Coffee break

16:50 – 17:10 I. Kudinov, N. Evseev. Role of viscosity in continuum mechanics approach to describe flow through porous media

17:10 – 17:30 I. Morozov. Atomic force microscopy of the structure of filled rubber compounds

17:30 – 17:50 I. Neygebauer. MAC solution and Cauchy-Born rule

17:50 – 18:10 M. Davydova, V. Leontiev, V. Chudinov. Scaling in glass fragmentation under quasistatic and dynamic loading

Room B

Morning Session

CHAIRPERSON I. SEVOSTIANOV

Nanomechanics

11:50 – 12:10 M.Yu. Gutkin, A.G. Sheinerman, M.A. Smirnov. Screw dislocation behavior in highly porous elastic medium

12:10 – 12:30 S.A. Chivilikhin, E.N. Korytkova, T.P. Maslennikova, I.Yu. Popov, D.S. Chivilikhin, V.V. Gusarov. Evolution of nanorolls ensemble

12:30 – 12:50 O. Plekhov, O.B. Naimark .. Infrared thermography study of energy dissipation and storage processes in metals under plastic deformation and failure

12:50 – 13:10 A. Abramyan, L. Mirantsev . Nano-fluid structure interaction

13:10 – 13:30 S. Antonyuk, S. Palis. S. Breakage kernel derivation for needle-shaped L-threonine crystals using the discrete element method

Evening Session

CHAIRPERSON A. KULESHOV

Dynamics of rigid bodies and multibody dynamics

15:30 – 15:50 C. Gandara, M. Cartmell. De-Spin of a Motorised Momentum Exchange Tether

15:50 – 16:10 I. Pasyukova. Non-linear vibration of the rotor-housing system

16:10 – 16:30 A. Kuleshov. On the Explicit Form of the First Integrals in some Problems of Nonholonomic Mechanics

Coffee break

16:50 – 17:10 Yi Chen, M. Cartmell. Hybrid Sliding Mode Control for Motorised Space Tether Spin-up when Coupled with Axial Oscillation

17:10 – 17:30 A.F. Al-Dwairi, S.E. Al-Lubani, O.M. Al-Araidah. Analytical Synthesis of Crank-Type Four-Bar Linkages with Minimax Link-Length Ratios

17:30 – 17:50 A. Shvygin. On Lyapunov exponents of pendulum motion of rigid body in a central Newtonian force field

Room C

Morning Session

Minisymposium “Intensive thermo-visco-elastic waves in solids with variable internal structure”

CO-CHAIRPERSONS E. AERO, A. PORUBOV

11:50 – 12:20 D.A. Indeitsev, V.N. Naumov, B.N. Semenov, M.D. Sterlin. Modeling and simulation of thermo-acousto-elastic waves in solids of complex rheology

12:20 – 12:50 E.L. Aero, A.N. Bulygin. Localized and periodic strongly nonlinear waves in crystalline lattices

12:50 – 13:20 Yu. Mescheryakov. Short induced instability and rotational structures in solids

13:20 – 13:50 V.I. Erofeyev, Ju.V. Vinogradova. Riemann Waves and Solitons in Nonlinear Cosserat Media

Evening Session

Minisymposium “Intensive thermo-visco-elastic waves in solids with variable internal structure”

CO-CHAIRPERSONS E. AERO, A. PORUBOV

15:00 – 15:30 A. Il'ichev, Y. Fu. Solitary waves in fluid-filled elastic tubes

15:30 – 16:00 V. Odintsova. The stability and instability of heat pipes

16:00 – 16:30 A.I. Potapov, S.A. Konoplev, Yu.P. Bodunova. Interaction of nonlinear localized waves. Analytical modeling and computer simulation

Coffee break

16:50 – 17:20 A.N. Bulygin, E.L. Aero, Yu.V. Pavlov. Some Dynamical Problems for Generalized (3+1) Sine-Gordon Equation

17:20 – 17:45 M.Yu. Filimonov. Application of method of special series for solution of nonlinear problems of continuum mechanics

17:45 – 18:15 A.V. Porubov. Modelling of intensive nonlinear strain waves

18:15 – 18:45 A.O. Malkhanov, V.I. Erofeyev. Nonlinear Magneto-Elastic Waves in Rods

JULY 4, SATURDAY

Room A

Morning Session

CHAIRPERSON V. EREMEYEV

- 10:10–10:50 H. Altenbach.** Methodic representation of flow potentials
10:50–11:30 V.A. Palmov. Simple solutions in the theory of Cosserat

*Coffee break
Morning Session*

CHAIRPERSON V. EREMEYEV

Mechanical and civil engineering applications

- 11:50–12:10 N. Nikitina.** Experimental evaluation of in-plane stress of pipelines under hydrostatic pressure
12:10–12:30 R.A. Arutyunyan, K.S. Yakimova. Damage of high elastic thin layer under the action of cyclic compression
12:30–12:50 M. Ahmad, V. Chigarev. Thermal deformation in powder strip fusion
12:50–13:10 V. Kolykhalin. Imitation modelling of phase transition from axial modes to tangential modes in cylindrical tank
13:10–13:30 L.H. Lang, B.S. Liu, G.C. Gu, J.N. Duan, E. Lyamina. Investigation of thin wall sheet hydroforming for complicated shape part in aircraft industry
13:30–13:50 L.V. Nikitin, A.V. Zvyagin. Statics and dynamics of winded on cylinder flexible elastic thread
13:50–14:10 A.V. Zaitsev, N.G. Zlobin, O.Yu. Isaev, D.V. Smirnov. Mathematical model for thermo-elastic deformation of nano-structured flexible graphite seals

Evening Session

CHAIRPERSON S. GAVRILOV

Solids and structures

- 15:30–15:50 E. Rudoy.** On elastic bodies with rigid inclusions and cracks: asymptotic analysis of energy functional
15:50–16:10 N. Banichuk. On the Limit Velocity of Axially Moving Elastic Band
16:10–16:30 V. Hakobyan. Transfer from semi-infinite stirp to wedge-shaped plate taking into account the non-homogeneous ageing factor

Coffee break

- 16:50–17:10 P. Dyatlova, M. Rudaya, A. Majorov.** Analysis of the stress-strained state of the tape during its winding around the cylindrical solid
17:10–17:30 Yu.G. Pronina. Elastic tube subjected to pressure and general corrosion
17:30–17:50 V.V. Lalin. Theorem of uniqueness in nonlinear dynamic elasticity theory
17:50–18:10 H. Mahbadi, M. Eslami. Influence of Creep on Cyclic Loading Behavior of Thick Spherical Vessels
18:10–18:30 E. Lyamina. A comparative study of solutions based on two types of the gradient theory of plasticity
18:30–18:50 S. Kostyrko, M. Grekov. Stress and Stability Analysis of a Thin Film Surface Subjected to High Temperature

Room B

Morning Session

CHAIRPERSON A. PORUBOV

Wave motion

- 11:50–12:10 D. Mheryan, M.V. Belubekyan.** Three dimensional surface waves in transversely isotropic medium
12:10–12:30 N. Kozlov. Influence of Viscosity of the Liquid on the Vibrational Hydrodynamic Top
12:30–12:50 G. Filippenko. The forced vibrations of the shells partially submerged into the liquid.
12:50–13:10 L. Molotkov. Wave propagation along curvilinear boundaries of elastic and fluid media
13:10–13:30 I. Keller. Equilibrial forms of the free surface of nonlinearly viscous band under uniaxial tension

Evening Session

CHAIRPERSON A. ZAITSEV

Fluid and gas

- 15:30–15:50 G. Manzini, L. Iannantuoni.** A unified graphic environment dedicated to SES code for optimization of fire ventilation strategies in subway networks
15:50–16:10 A. Alabuzhev. Effect of the contact-line dynamics on the oscillations of a oblate drop
16:10–16:30 M. Borich, L. Friedland. Ac-driven chirped vorticity holes in inviscid incompressible fluid

Coffee break

Mechanical and civil engineering applications

- 16:50–17:10 A. Knyazeva.** One-dimensional models of filtration with regard to thermal expansion and volume viscosity
17:10–17:30 L.A. Nazarov, L.A. Nazarova, M.P. Kozlova. Block rock mass deformation and fractal dimension of discontinuities
17:30–17:50 L.A. Nazarova, V.M. Fomin, A.N. Ryashentsev. Experimental and theoretical investigation of filtration regime in a productive stratum at unsteady effect to host block rock mass
17:50–18:10 N.N. Myagkov, T.A. Shumikhin, L.N. Bezrukov. Experimental and numerical study of high-velocity impact interaction of compact projectile with discrete shields
18:10–18:30 S.A. Lychev, A.V. Manzhurov. Variational principles in the theory of accreted solids
18:30–18:50 P. Tovstik. On the 2D equations of plates made of an anisotropic material