

MECH2012 SCIENTIFIC PROGRAM

Monday, November 19, 2012		
9:30-12:30	REGISTRATION Institute of Mechanics – BAS, 1113 Sofia, Acad. G. Bonchev St., Bl.4	
13:30	Opening Ceremony (Great Hall, main building of the Bulgarian Academy of Sciences, 1040 Sofia, 15th November St., 1)	
13:30 - 13:35		<i>Stefan Radev</i> : Opening speech
13:35 – 13:55		<i>Vasil Kavardjikov</i> : Director of the Institute of Mechanics: Welcoming speech
13:55 -14:10		<i>Anguel Baltov</i> : 50 years research in mechanics at BAS
14:10 -14:30		Congratulatory addresses and greetings
14:30 -15:00		Presentation of diplomas and awards
15:00 - 15:20		<i>Dragan Spasic</i> : On two-body collision patterns
15:20 -15:50		<i>Natalya Kizilova</i> : Mechanics of concentrated and diluted nanofluids
15:50 – 16:20		<i>J.- F. Stoltz</i> et al.: Mechanobiology of cells and tissues: a survey
16:20- 16:50		<i>Natalya Kizilova</i> : Contemporary problems of biomechanics: from nanostructures to ecosystems
17:00	Cocktail	
<p>BM – Biomechanics FM – Fluid Mechanics GEN – General topics MMS – Mechanics of Multibody Systems SM – Solid Mechanics MMNS – Mathematical Modelling and Numerical Simulations PCM – Physico-Chemical Mechanics</p>		

Tuesday, November 20, 2012		
9:30-12:00	Registration, Institute of Mechanics-BAS Acad. G. Bonchev St., block 4	
Hall 200	Hall 300	Hall 510
8:30-10:30	9:00-10:00	8:30-10:00
Session 1 FM	Session 3 MMNS	Session 4 BM
Coffee break		
10:40-12:20	10:20-11:40	10:10-10:50
Session 1 FM	Session 3 MMNS	Session 4 BM
12:30 - 14:30 Reception on the occasion of the 70th anniversary of Prof. Stefan Radev, Hall 510		
LUNCH		
14:30-16:00	14:30-16:10	
Session 2 FM	Session 5 BM	
Coffee break		
16:10-17:30	16:20-17:20	
Session 2 FM	Session 5 BM	
<p align="center">SESSION 1: FLUID MECHANICS, Hall 200</p> <p align="center">The session is dedicated to the 70th anniversary of the Corresponding Member of the Bulgarian Academy of Sciences Prof. DSc. Stefan Radev</p> <p align="center">Chairperson: Nikolay K. Vitanov</p>		
8:30-8:35		<i>N. K. Vitanov</i> Opening
8:35-8:50		<i>Stefan Radev</i> : Fluid mechanics at the institute of mechanics-achievements and perspectives
8:50-9:10		<i>Fabrice R.A. Onofri</i> : From the instability and optics of capillary jets and bubbles: a fruitful Franco-Bulgarian collaboration with Prof. Stefan Radev's group
9:10-9:30		<i>M. J. Medale</i> : An efficient continuation algorithm to compute steady state bifurcation diagrams in large size coupled fluid flow and heat transfer problems
9:30-9:50		<i>S. Tabakova, S. Radev</i> : On the nonlinear instability of viscous capillary films and jets
9:50-10:10		<i>K. B. Radev</i> : Nonlinear dynamics of freely falling capillary jets
10:10-10:30		<i>P. Dobрева, M. Kartalev</i> : Magnetospheric magnetic field model with complete internal geomagnetic field
10:30-10:40 – Coffee Break		

10:40-11:00		<i>I. Zheleva</i> : Research in Fluid Mechanics at the University of Ruse – A Historical Overview
11:00-11:20		<i>D. Koulova-Nenova</i> : Nusselt number augmentation by electro-thermo-convection in 2D
11:20-11:40		<i>I. Jordanov, E. Nikolova</i> : On nonlinear waves in the spatiotemporal dynamics of interacting populations
11:40-12:00		<i>Z. I. Dimitrova, K. N. Vitanov</i> : Integrability of differential equations with fluid mechanics application. From Painleve property to the method of simplest equation
12:00-12:20		<i>N. Filipova</i> : Development of an interactive computer program for design of small scale drip irrigation system in GUI – MATLAB
12:30 - 14:30 Reception on the occasion of the 70th anniversary of Prof. Stefan Radev, Hall 510		
SESSION 2 – FLUID MECHANICS, Hall 200		
Chairperson: Sonya Tabakova		
14:30-15:00		<i>Marcel Hennenberg, Slavtcho Slavtchev, Galin Valchev</i> : On Faraday's instability in magnetic liquids: Ince-Erdelyi's approach applied to the Hill equation describing oscillations of a ferrofluid free surface
15:00-15:20		<i>Milos M Jovanovic, Vlastimir D Nikolic, Pedja M Milosavljevic</i> : Rayleigh-Bénard convection in an inclined fluid layer with spatial temperature modulation on both plates
15:20-15:40		<i>Slavcho Slavtchev, Penka Kalitzova-Kurteva, Alex Oron</i> : Nonlinear analysis of long-wavelength monotonic Marangoni instability in a binary-liquid layer with the nonlinear Soret effect
15:40-16:00		<i>P. Dobrova</i> . Modeling extreme solar wind events with inputs from a Web-based application
16:00-16:10 Coffee Break		
16:10-16:30		<i>P. Dobrova</i> . Algorithm for optimization the code of the numerical magnetosheath-magnetosphere model
16:30-16:50		<i>E. Bournarski</i> : Numerical analysis of added mass effect of unsteady two-phase solid-liquid pipe flow
16:50-17:10		<i>N. K. Vitanov, N. Hoffmann</i> : Deep water waves. On nonlinear Schroedinger equation and its solutions

SESSION 3: MATHEMATICAL MODELING AND NUMERICAL SIMULATIONS, Hall 300		
Chairpersons: Slavcho Slavchev, Nina Pesheva		
9:00 -9:20		<i>Michail Todorov</i> : Investigation of the Long-Time Evolution of Localized Solutions of a Dispersive Wave System
9:20 -9:40		<i>Yonko Dinev Stoyanov, Petia Dineva</i> : - Dynamic cracks interaction in magnetoelastic materials by traction BIEM
9:40 –10:00		<i>Sabīne Upnere, Normunds Jakobsons, Roberts Joffe</i> : Numerical analysis of large telescopes in terms of induced loads and resulting geometrical stability
10:00-10:20 – Coffee Break		
10: 20-10:40		<i>Liliya Petrova</i> : The arc finite element fixed a both ends of a plane circumference with tangential load
10:40 - 11:00		<i>Kiril Stoyanov Shterev, Stefan Stefanov</i> : Determination of zone of flow instability in a gas flow past a square particle in a microchannel
11:00 - 11:20		<i>Emil Manoach</i> : Dynamics and Fault Localization of Composite Beams with Delamination
11:20- 11:40		<i>A. A. Liolios, G. Hatzigeorgiou, A. Liolios, S. Radev</i> : A numerical approach for estimating the effects of multiple earthquakes to seismic response of structures
11:40-12:10	Key-note lecture	<i>M. Mihovski</i> : 50 years research in nondestructive testing in Bulgaria
SESSION 4 – BIOMECHANICS, HALL 510		
Chairperson: Petko Kiriazov		
8:30-9:00	Key-note lecture	<i>Yuriy Ivanovich Nyashin, Valeriy Alexandrovitch Lokhov, Victor Moiseevich Tverier, Michel Mesnard</i> : The Interaction of the Dentofacial System with other Systems of the Human within the Framework of the Conception of Virtual Physiological Human
9:00-9:20		<i>Petko Kiriazov</i> Biomechanics, rehabilitation and optimisation of human motion
9:20-9:40		<i>Ivanka Petkova Veneva</i> Propulsion system for artificial muscles
9:40-9:50 – Coffee Break		
9:50-10:10		<i>Silviya Koleva Angelova</i> Estimation of the movement deficit in the upper arm in stroke patients using EMG signals – a preliminary study
10:10-10:30		<i>Gergana Stefanova Nikolova</i> A comparative analysis of the average human anthropometrical and mass characteristics of different nationalities

SESSION 5 – BIOMECHANICS, HALL 300		
Chairperson: Nadia Antonova		
14:30-14:40		<i>Nadia Antonova</i> : Biomechanics in the Institute of Mechanics to BAS – results and perspectives
14:40-15:10	Keynote lecture	<i>Alexander Rachev</i> Inverse problems of vascular mechanics
15:10-15:30	Keynote lecture	<i>Ludmil Nikolov</i> : Cast Biomechanics for the Principal Part in Inventive Activity for High Performance Biofilm Reactors Development
15:30-15:50	Keynote lecture	<i>Svetoslav Svetoslav Markov</i> : On Microbial Growth Models
15:50-16:10		<i>Svetoslav Ganchev Nikolov</i> : Mathematical modeling and analysis of miRNA regulation
16:10-16:20 Coffee Break		
16:20-16:40		<i>Nadia Antonova, Nely Koseva, Agnieszka Kowalczyk, Pavel Riha, Ivan Ivanov</i> : Influence of nanoparticles on mechanical and electrical properties of RBC suspensions
16:40-17:00		<i>Mariya Lyubenova Antonova</i> : Biomechanical foundations of the oscillometric method for blood pressure measurement.
17:00 -17:20		<i>Katya Marinova Simeonova</i> : Stem cells: definition, properties and characteristics. Modeling by classical theories of mathematics and mechanics. Application to treatment of cancer and neurological diseases in clinical medicine

Wednesday, November 21, 2012		
Hall 200	Hall 300	Hall 510
9:00-10:30	9:30-10:50	9:00-10:30
Session 6 MMNS	Session 7 PCM	Session 8 SM
Coffee break		
10:40-12:00	11:00-12:00	10:40-12:20
Session 6 MMNS	Session 7 PCM	Session 8 SM
12:30 - 13:30 LUNCH		
13:30-14:30		
Poster session		
Young scientists award presentation HALL 510		
Coffee break		
14:30-18:00 EXCURSION		
18:00 Official dinner		
SESSION 6: MATHEMATICAL MODELING AND NUMERICAL SIMULATIONS, HALL 200		
Chairperson: Stefan Stefanov		
9:00-9:30	Keynote lecture	<i>Jordan Georgiev Brankov, Nina Pesheva:</i> Position-induced phase change in a TASEP with a double-chain section (a model of biological transport)
9:30 - 9:50		<i>Krassimir Georgiev, Zahari Zlatev:</i> Computer modelling of long range transport of air pollutants using supercomputers
9:50 - 10.10		<i>Dimitris Valougeorgis:</i> Simulation of gaseous non-equilibrium transport phenomena via kinetic theory
10.10 - 10:30		<i>Raffaella Pavani, Filippo Gazzola:</i> About finite time blow of solutions to nonlinear fourth order differential equations
10:30-10:40 Coffee Break		
10:40 – 11:00		<i>Kavan Khaledi, Shorash Miro, Tom Schanz:</i> Application of metamodeling techniques for mechanized tunnel simulation
11:00-11:20		<i>Elena Nikolaevna Aristova:</i> Fast calculations of radiative processes in the earth atmosphere
11:20 11:40		<i>Vladimir Vladimirovich Aristov:</i> Nonequilibrium supersonic flows described by direct solutions for kinetic equations
11:40 –12:00		<i>Dejan Petkow, Stefan Stefanov, Georg Herdrich:</i> A Probabilistic Particle Method in the Light of Future Research Problems

SESSION 7: PHYSICO-CHEMICAL MECHANICS, HALL 300

Chairperson: Rumiana Kotsilkova

9:30-10: 00	Keynote lecture	<i>Rumiana Kotsilkova, Evgeni Ivanov, Irena Borovanska, Julij Tsekov, Verislav Angelov, Ivanka Petrova</i> - Micro- and nanomechanics of polymer nanocomposites
10:00-10:30	Keynote lecture	<i>Christo Boyadjiev</i> - Theoretical chemical engineering. Modeling and Simulation
10:30-10:50		<i>Alesia Paddubskaya, Polina Kuzhir, Artyom Plyushch, Nadezhda Valynets, Mikhail Shuba, Sergey Maksimenko, Jan Macutkevic, Juras Banys, Rumiana Kotsilkova, Alain Celzard, Immacolata Sacco, Stefano Bellucci</i> : High conducting epoxy resin / carbon composites for electromagnetic applications
10:50-11:00 Coffee Break		
11:00-11:20		<i>Artyom Plyushch, Polina Kuzhir, Sergey Maksimenko, Konstantin Lapko, Elisaveta Frolova, Diana Boiba, Vladimir Lomonosov, Oleg Ivashkevich, Anatoly Lesnikovich</i> : Strength properties of heat resistant phosphate materials containing boron compounds
11:20-11:40		<i>Margarita Natova, Vassil Georgiev</i> : Processing of filled polymer micro- and nanocomposites – developments and growing trends
11:40-12:00		<i>Rumen Krastev Krastev, Strashimir L. Djoumalitsky, Irena T. Borovanska</i> : Long-term strength of polymer blends from recycled materials

SESSION 8: SOLID MECHANICS, HALL 510

Chairperson: Peter Djondjorov

9:00-9:30	Plenary lecture	<i>J. Ivanova, V. Valeva, G. Nikolova, P. Dineva, T. Petrova, A. Yanakieva, Z. Mroz, W. Becker, B. Gambin</i> : Interface delamination of bimaterial structures with different industrial applications
9:30-9:50		<i>W. Becker</i> : Stress concentrations in composite structures and their assessment in regard of effective strength
9:50-10:10		<i>S. Lekova, A. Alexanderov, M. Milenova, T. Tzolov</i> Orthogonal dynamic model of viscoelastic deformation under variable concentration and loading
10:10-10:30		<i>A. Alamin, R. Zhang</i> : Modeling of acoustic-emission wave propagation in layered media

10:30-10:40 Coffee Break

Chairperson: Jordanka Ivanova		
10:40-11:00		<i>V. Lokhov</i> : Stress and deformation control by eigenstrain: application in living and non-living systems
11:00-11:20		<i>G. Chalakova, M. Datcheva, R. Iankov, A. Baltov, D. Stoychev</i> : Comparative study via nanoindentation of the mechanical properties of conversion Cr ⁺⁶ -containing and Cr ⁺⁶ -free corrosion protective layers on aluminium
11:20-11:40		<i>T. Atanackovic, S. Pilipovic, D. Zorica</i> : Forced oscillations of a body attached to a solid or fluid-like viscoelastic rod of fractional type
11:40-12:00		<i>P. Djondjorov</i> Solid mechanics research at the Institute of Mechanics – an overview
12:00-12:20		<i>E. Atanassov, V. Vassilev</i> : Cylindrical and axially symmetric equilibrium shapes of lipid bilayer membranes
12:20 -13:20 LUNCH		
POSTER SESSION and YOUNG SCIENTISTS AWARD presentation , HALL 510		
Chairperson: Nadia Antonova		
13:20-14:30		Poster session and Coffee Break
<p>P1. <i>A. Baltov, A. Yanakieva</i>: Identification of constitutive equation on the basis of experimental data</p> <p>P2. <i>A. Handruleva, K. Kazakov, A. Yanakieva</i>: Comparison of fem computational models of shear walls with holes.</p> <p>P3. <i>R. Iankov, M. Datcheva, S. Cherneva, G. Chalakova, D. Stoychev</i>: Numerical simulation of Instrumented Indentation Test.</p> <p>P4. <i>T. Schanz, N. Müthing</i>: Stability analysis of geotechnical problems using a strain energy criterion.</p> <p>P5. <i>Long Tuan Nguyen, M. Datcheva, T. Schanz</i>: A thermo-hydro mechanical column experiment to study expansive soil behaviour.</p> <p>P6. <i>V. Zarev, M. Datcheva, T. Schanz</i>: Methods of System Identification for the Adaption of Numerical Simulation Models.</p> <p>P7. <i>P. Popova-Krumova, M. Doichinova</i>: New approach for parameter identification of multiobjective models.</p> <p>P8. <i>M. Doichinova</i>: A new approach of the column apparatuses modeling.</p> <p>P9. <i>L. Petrova</i>: On the shape functions of a arc finite element fixed both ends of a plane circumference.</p> <p>P10. <i>G. Georgiev, S. Popov, V. Manolov, R. Dimitrova, P. Kuzmanov</i>: Computer simulation of the heat exchange process and the microstructure formation during crystallization of metal alloys.</p> <p>P11. <i>M. Mironova, V. Naidenov</i>: Strength – deformation properties of fine-grained fiber-reinforced concretes.</p> <p>P12. <i>I. Petrova, E. Ivanov, Y. Tsekov, V. Angelov, R. Kotsilkova</i>: Applied Study of Different Nanostructured Materials on the Basis of the Nanoindentation Method.</p> <p>P13. <i>I. Borovanska, Y. Tsekov, V. Angelov, E. Ivanov, R. Kotsilkova, S. Djoumaliski</i>: Tribological measurements of polypropylene nanocomposites by scratch and friction tests.</p> <p>P14. <i>I. Rostovsky, V. Naidenov</i>: Construction and design of fiber-reinforced slabs on ground.</p> <p>P15. <i>A. Aleksandrova, N. Antonova</i>: Experimental methods for investigation of mechanical and rheological behavior of leukocyte adhesion under flow.</p>		

P16. N. Antonova, P. Tosheva, E. Toshev, I. Velcheva: Numerical analysis of 3D blood flow and common carotid artery hemodynamics in the carotid artery bifurcation with stenosis		
P17. V. Kostova, N. Antonova, I. Ivanov, I. Velcheva, Rheological disturbances in patients with diabetes – a risk factor for vascular diseases		
P18. E. Petrova, P. Zlateva: Study of the oxidation dynamics of Fe^{2+} by <i>Acidithiobacillus ferrooxidans</i> at initial phases of adaptation to high substrate concentrations		
P19. G. Tzvetkova: The First Bulgarian Industrial Robot “PROBO”		
P20. Dimitar Trifonov, Georgy Simeonov, Robert Kazandjiev: Modeling of microparticle motion in a MEMS microchannel		
P21. Miglena Kirilova, Dessislava Pashkouleva, Vasil Kavardjikov: An influence of age on the biomechanical properties of human abdominal fascia		
P22. Stefan Karastanev, Radosveta Antonova, Mihaela Kalaidjieva Kalman filter application for tracing and analysing of ankle foot complex movements		
14:30-18:00		Excursion
18:00		Official dinner
Thursday, November 22, 2012		
SESSION 9: MECHANICS OF MULTIBODY SYSTEMS and GENERAL TOPICS, HALL 200		
Chairperson: Kostadin Kostadinov		
8:30-8:50		<i>Kiril Arnaudov:</i> An alternative method for the analysis of complex compound planetary gears – essence and capabilities
8:50-9:10		<i>Detelina Ignatova:</i> Modular building of robots for micromanipulation. Presentation of start-up "MICRON" LTD.
9:10-9:30		<i>V. Slavkov - SPESIMA GmbH</i> presentation
9:30-9:50		<i>Mihail Tsveov, Dimitar Chakarov:</i> Controllable compliance joints for human oriented robots
9:50-10:10		<i>Grigor Peev Zhelev:</i> Software for graphical investigation of planar closed kinematic chains for robots and manipulators
10:10-10:30		<i>Clementina Mladenova, Ivailo M. Mladenov:</i> Vector-decomposition of finite rotations
10:30-10:40 Coffee Break		
10:40-11:00		<i>Gatis Gaigals</i> Radio-telescope RT-16 control system
11:00-11:20		<i>Zdravko Dimitrov Andonov:</i> Multidimensional transferences and GUT-synergetics of celestial mechanics, quantum mechanics, quantum physics and quantum cosmology
11:20-11:40		<i>G. Tzvetkova:</i> Robonaut 2: Mission, Technology, Perspectives
11:40-12:00		<i>Polina Mihova Mihova, Iliya Pendzhurov, Jivka Vinarova:</i> Telemedical solutions in the field of biomechanics

