

3rd

**Polish
Congress
of Mechanics**

21st

**International Conference
on Computer
Methods in Mechanics**

Programme

DETAILED PROGRAMME OF THE PCM-CMM-2015 CONGRESS

MONDAY, SEPTEMBER 7th

GUT Fahrenheit Courtyard

17:00 – 21:30 GET-TOGETHER PARTY
REGISTRATION and a WELCOME SNACK

TUESDAY, SEPTEMBER 8th

GUT Room 155

8:00 – 9:00 REGISTRATION

Auditorium Novum

9:00 – 9:30 PCM-CMM-2015 OPENING CEREMONY

Auditorium Novum

9:30 – 10:20 GENERAL LECTURE

Oesterle B., Bischoff M., Ramm E.
Hierarchic isogeometric analyses of beams and shells

10:20 – 10:40 COFFEE BREAK

10:40 – 12:05 PARALLEL SESSIONS

**Auditorium Novum MS03: Computational Mechanics of Concrete and Geomaterials
Session 1**

Chair: Tejchman J.

Keynote Speech

10:40 – 11:05 Pietruszczak S., Haghighat E.
Description of damage process in sedimentary rocks

11:05 – 11:20 Königsberger M., Pichler B., Hellmich C.
Micromechanics of hydrating cement pastes considering progressive C-S-H gel densification

- 11:20 – 11:35 Koniorczyk M., Gawin D.
Modelling the frost-induced damage in fully saturated cement-based materials
- 11:35 – 11:50 Januszkiewicz M., Pesavento F., Grymin W., Gawin D.
Modelling the strains induced by Delayed Ettringite Formation in cement-based materials
- 11:50 – 12:05 Grymin W., Koniorczyk M., Gawin D.
Mathematical model of concrete degradation due to the alkali-silica reaction at the mesoscopic level

GUT Aula **MS25: Tolerance and Non-Asymptotic Modelling of Microstructured Media
Session 1: Modelling of thermal and elastic problems in composites**

Chair: Śniady P.

- 10:40 – 10:50 **A Tribute to Prof. Czesław Woźniak
in connection with His 60th Anniversary of Scientific Activities
and the recognition of important scientific achievements
in Engineering and Applied Mathematics**
- 10:50 – 11:05 Wągrowaska M., Szlachetka O.
Heat conduction in biperiodic rigid composites
- 11:05 – 11:20 Wągrowaska M., Szlachetka O.
Tolerance modelling of elastic-nonelastic multilayered two-component composites
- 11:20 – 11:35 Kula D., Radzikowska A., Wierzbicki E.
Impact of tolerance averaging of heat transfer equation into exact description of a boundary effect phenomenon
- 11:35 – 11:50 Jędrysiak J., Pazera E.
Tolerance modelling of thermoelastic phenomena in functionally graded laminates
- 11:50 – 12:05 Bagdasaryan V.
Thermal stresses in elastic periodic laminates

GUT Room 300 **MS17: Physics Based Modelling in Solid Mechanics
Session 1: Plasticity, Creep, Damage**

Chair: Altenbach H., Skoczeń B.

- Keynote Speech**
- 10:40 – 11:05 Petryk H., Kurska M.
The energy approach to rate-independent plasticity of metal single crystals
- 11:05 – 11:20 Fraś L., Pęcherski R.B.
Viscoplasticity of magnetorheological materials – theoretical description and experimental investigations
- 11:20 – 11:35 Santaoja K.
Thermodynamics of a material model showing creep and damage
- 11:35 – 11:50 Ustrzycka A., Skoczeń B.
Kinetics of evolution of radiation induced damage
- 11:50 – 12:05 Gaćeša M., Jelenić G.
Objectivity of strain measures in the fixed-pole approach

GUT Room 200 **MS04: Contact Mechanics
Session 1**

Chair: Zmitrowicz A.

- Keynote Speech**
- 10:40 – 11:05 Sofonea M.
History-dependent variational inequalities in contact mechanics
- 11:05 – 11:20 Migórski S.
Non-smooth dynamic viscoelastic frictional contact problem with memory modeled by hemivariational inequality
- 11:20 – 11:35 Bogacz R.
Frictional wear of a wheel-rail system depending on material hardness
- 11:35 – 11:50 Rzczycki A., Buczkowski R.
A study of surface roughness in elasto-plastic shrink-fit assembly
- 11:50 – 12:05 Silantyeva O.A., Dmitriev N.N.
Dynamics of bodies under symmetric and asymmetric orthotropic friction forces

**GUT Room 211 MS14: Multiscale Modelling of Materials and Structures
Session 1**

Chair: Burczyński T., Pietrzyk M.

- Keynote Speech**
- 10:40 – 11:05 Dziaekiewicz G.
Optimal design of eigenfrequencies for a functionally graded piezoelectric plate by two-scale model and harmony search
- 11:05 – 11:20 Romanowicz M.
Numerical assessment of failure mechanisms due to transverse loading in unidirectional fiber-reinforced polymers
- 11:20 – 11:35 Ogierman W., Kokot G.
Multiscale analysis of metal matrix composite with ceramic reinforcement using embedded cell approach and Johnson-Holmquist constitutive model
- 11:35 – 11:50 Mityushev V.
Effective conductivity of random 2D composites
- 11:50 – 12:05 Beluch W., Hatłas M.
Multiscale evolutionary optimization of functionally graded materials

**GUT Room 213 MS21: Smart Material Systems and Structures
Session 1**

Chair: Kuczma M.

- Keynote Speech**
- 10:40 – 11:05 Bartel T., Kiefer B., Buckmann K., Menzel A.
Application of quasiconvex analysis: enhanced micromechanical modelling of martensitic phase transformations and numerical implementation
- 11:05 – 11:20 Kureš M.
Subgroups of jet groups and material symmetries
- 11:20 – 11:35 Ostwald R., Bartel T., Menzel A.
A framework for the simulation of phase-transforming elasto-plastic SMA and TRIP steel polycrystals
- 11:35 – 11:50 Tuma K., Stupkiewicz S., Petryk H.
Phase-field modelling of twinning and martensitic transformation at finite strain
- 11:50 – 12:05 Rączka W., Konieczny J., Sibiłak M., Kowal J.
Frequency domain model of active vibration absorber based on SMA spring

GUT Room 462 **MS16: Optimization of Structural Topology**
Session 1: Methods, Part 1

Chair: Lewiński T.

Keynote Speech

- 10:40 – 11:05 Falach L., Segev R.
On the optimization of hyper-stress fields
- 11:05 – 11:20 Brudło K., Nowak M.S., Morzyński M., Bronny P.
Biomimetic optimisation – differences and similarities in comparison to the SIMP method
- 11:20 – 11:35 Bołbotowski K., Sokół T.
New method of generating Strut and Tie models using truss topology optimization
- 11:35 – 11:50 Łukasiak T.
HS(ro) – an isotropic material interpolation scheme based on Hashin-Shtrikman variational bounds
- 11:50 – 12:05 Czarnecki S., Wawruch P.
Selected problems of numerical analysis of Free Material Design

GUT Room 167 **MS11: Mechanics of Complex Materials, Structures and Processes**
Session 1

Chair: Mishuris G.

Keynote Speech

- 10:40 – 11:05 Movchan N., Movchan A., Brun M.
Structured waveguides: Floquet waves and polarisers in elongated systems
- 11:05 – 11:20 Bolanowski K.
Influence of temperature on the creep limit of microalloyed steel containing Nb, V and N
- 11:20 – 11:35 Powalka B., Pawełko P., Grządziel Z.
Regenerative chatter stability as a design criterion in the design of rope threading lathe
- 11:35 – 11:50 Sitarz P., Powalka B., Parus A.
Dynamic and positioning analysis of the feed drive of the rope threading lathe
- 11:50 – 12:05 Škec L., Jelenić G.
A multi-layer beam finite element for mixed-mode delamination in 2D beams

IFFM of PAS Aula **MS09: Mechanical and Thermo-Chemical Interactions in the Reactors with Moving and Fluidized Bed**
Session 1

Chair: Stelmach S.

Keynote Speech

- 10:40 – 11:05 Kardaś D., Polesek-Karczewska S., Ciżmiński P.
Dynamics of heat and mass transfer in a moving reactive granular bed
- 11:05 – 11:20 Bigda J., Klimanek A., Chmielniak T., Adamczyk W., Szlęk A., Stelmach S.
Numerical modelling of CO₂ enriched gasification of coal in a pressurized circulating fluidized bed reactor
- 11:20 – 11:35 Kluska J.
Effect of biomass settling in the fixed bed gasification reactor
- 11:35 – 11:50 Polesek-Karczewska S., Szumowski M.
Study on the impact of char properties on the gasification effectiveness

11:50 – 12:05 Adamczyk W., Białocki R.A., Kruczek T.
Inverse, non-destructive technique of retrieving conductivity of orthotropic materials

12:05 – 12:30 COFFEE BREAK

12:30 – 14:00 PARALLEL SESSIONS

**Auditorium Novum MS03: Computational Mechanics of Concrete and Geomaterials
Session 2**

Chair: Winnicki A.

- 12:30 – 12:45 Sakharov V.
Dynamic behaviour of Zymne Monastery Cathedral on soil base with consideration of non-linear deformation of materials
- 12:45 – 13:00 Podgórski J., Gontarz J.
Explanation of the mechanism of destruction of the cylindrical sample in the Brazilian test
- 13:00 – 13:15 Marczevska I., Rojek J., Kacianauskas R.
Investigation of micro-macro relationships of elastic parameters in the discrete element model of granular material
- 13:15 – 13:30 Zabulionis D., Kacianauskas R., Rimša V., Rojek J.
A model of stiffness of normal interaction of spherical particles embedded in matrix
- 13:30 – 13:45 Kozicki J., Tejchman J.
Investigations of vortex and anti-vortex structures in sand during plane strain compression by DEM
- 13:45 – 14:00 Skarżyński Ł., Nitka M., Tejchman J.
Modelling of concrete fracture at aggregate level using FEM and DEM based on real microstructure

**GUT Aula MS25: Tolerance and Non-Asymptotic Modelling of Microstructured Media
Session 2: Modelling of vibrations of the microheterogeneous structures**

Chair: Wągrowaska M.

Keynote Speech

- 12:30 – 12:55 Idzikowski R., Misiurek K., Śniady P.
Dynamic response of sandwich beam with periodic core due to fuzzy stochastic moving load
- 12:55 – 13:10 Marczak J., Jędrzyński J.
Tolerance modelling of vibrations in three-layered periodic structures
- 13:10 – 13:25 Jeleniewicz K., Nagórko W.
Free vibrations of plates reinforced by rods – the homogenization with micro – local parameters
- 13:25 – 13:40 Domagalski Ł., Jędrzyński J.
Nonlinear dynamic response of periodically inhomogeneous Rayleigh beams
- 13:40 – 13:55 Jędrzyński J.
Tolerance modelling of vibrations of visco-elastic thin periodic plates with moderately large deflections
- 13:55 – 14:10 Tomczyk B.
A new combined model of dynamic problems for thin uniperiodic cylindrical shells

GUT Room 300 **MS17: Physics Based Modelling in Solid Mechanics**
Session 2: Constitutive Modelling

Chair: Petryk H., Altenbach H.

- Keynote Speech**
- 12:30 – 12:55 Bielski J., Skoczeń B.
Modified constitutive model of discontinuous plastic flow in intermetallic composites
- 12:55 – 13:10 Kowalczyk-Gajewska K., Frydrych K., Maj M., Urbański L.
Micromechanical modelling of magnesium alloy and its experimental verification
- 13:10 – 13:25 Egner W., Mroziński S., Egner H., Sulich P.
Effect of temperature rate in modelling non-isothermal fatigue of steel
- 13:25 – 13:40 Tabin J., Skoczeń B.
Thermal and dissipative effect accompanying discontinuous plastic flow
- 13:40 – 13:55 Ryś M., Egner H.
A unified theory of elastic-plastic-damage material with plastic strain induced phase transformation

GUT Room 200 **MS04: Contact Mechanics**
Session 2

Chair: Buczowski R.

- 12:30 – 12:45 Račkauskas J., Kacianauskas R., Schneider M.
FEM simulation of electromagnetic forces in the rails of electromagnetic launcher
- 12:45 – 13:00 Litewka P.
Electro-mechanical multiple-point beam-to-beam contact
- 13:00 – 13:15 Pieńko M., Błazik-Borowa E.
Analysis of numerical model parameters of a modular scaffolding node loaded with shearing force
- 13:15 – 13:30 Fiborek P.
Modeling of adhesive contacts in composite materials
- 13:30 – 13:45 Kawa O., Litewka P.
Numerical analysis of contact between 3-D beams with deformable circular cross sections
- 13:45 – 14:00 Dziewiecki P., Weisenfels C., Wriggers P.
Validation of a contact layer element for soil-structure interactions within Abaqus software environment

GUT Room 211 **MS14: Multiscale Modelling of Materials and Structures**
Session 2

Chair: Kuś W., Madej Ł.

- 12:30 – 12:45 Zieliński T.G.
Multiscale modelling of the acoustic waves in rigid porous and fibrous materials
- 12:45 – 13:00 Matiss I.
A new approach to capacitance testing techniques - increasing dimension of the tests
- 13:00 – 13:15 Ekiert M., Młyniec A., Uhl T.
Prediction of the polymer degradation: a molecular dynamics study

- 13:15 – 13:30 Kałduński P.
Plane anisotropy parameters identification based on Barlat's model
- 13:30 – 13:45 Kacianauskas R., Kacinskaja I., Maknickas A., Markauskas D., Rojek J.
Simulation of attractive motion of silica microparticles in aerosol under acoustic excitation
- 13:45 – 14:00 Gedik Y.H., Celik O.C.
3D modeling and structural evaluation of ancient bozdogan (Valens) aqueduct in Istanbul

**GUT Room 213 MS21: Smart Material Systems and Structures
Session 2**

Chair: Schröder J.

- 12:30 – 12:45 Schröder J., Labusch M., Keip M.
Multiscale homogenization of magneto-electric composites: how the ferroelectric polarization affects the product properties
- 12:45 – 13:00 Dusthakar D.K., Menzel A., Svendsen B.
Numerical modelling of the rate-dependent polarisation switching in ferroelectric materials based on a sequential laminate approach
- 13:00 – 13:15 Koutsianitis P., Foutsitzi G., Drosopoulos G.A., Tairidis G.K., Stavroulakis G.E.
Optimally tuned fuzzy control for smart, possibly damaged piezocomposites
- 13:15 – 13:30 Lengiewicz J., Kursa M., Hołobut P.
Actuation by reconfiguration-modular active structures to create Programmable Matter
- 13:30 – 13:45 Przybylski J.
Analytical modelling of a piezoelectric displacement amplifier with two pairs of flexure hinges
- 13:45 – 14:00 Denisiewicz A., Kuczma M.
Two-scale elastic-plastic model of RPC in the plane stress state

**GUT Room 462 MS16: Optimization of Structural Topology
Session 2: Methods, Part 2**

Chair: Nowak M.S.

- 12:30 – 12:45 Rozvany G.I.N., Sokół T., Pomezanski V., Gaspar Z.
Extension of Michell's classical (1904) truss topology optimization theory to multiple load conditions, stress and displacement constraints, space (3D) trusses, probabilistic design and discontinuous support conditions
- 12:45 – 13:00 Sokół T., Rozvany G.I.N.
A new adaptive ground structure method for multi-load spatial Michell structures
- 13:00 – 13:15 Mrzygłód M.W.
A new procedure of solution search stabilization for evolutionary topology optimization
- 13:15 – 13:30 Myśliński A., Wróblewski M.
Structural optimization of contact problems using piecewise constant level set method
- 13:30 – 13:45 Jackiewicz J.
Optimization of structures of modern materials using a new hybrid evolution strategy

13:45 – 14:00 Bochenek B., Tajs-Zielińska K.
Optimization of structural topology using unstructured Cellular Automata

**GUT Room 167 MS11: Mechanics of Complex Materials, Structures and Processes
Session 2**

Chair: Movchan N.

Keynote Speech

12:30 – 12:55 O'Neill J., Selsil Ö., McPhedran R., Movchan A., Movchan N.,
Henderson-Moggach C.

Active cloaking of an inclusion at resonant frequencies for membrane and elastic flexural waves

12:55 – 13:10 Grochowska K., Marynowski K.

Dynamic behaviour of three layer composite cantilever beam with viscoelastic core

13:10 – 13:25 Kyzioł J., Okniński A.

Metamorphoses of resonance curves in systems of coupled oscillators

13:25 – 13:40 Witek L., Bednarz A., Stachowicz F., Smirnov I., Kazarinov N.

Influence of crack size on resonant frequency of compressor blade

**IFFM of PAS Aula MS09: Mechanical and Thermo-Chemical Interactions in the Reactors with
Moving and Fluidized Bed
Session 2**

Chair: Polesek-Karczewska S.

12:30 – 12:45 Klimanek A., Adamczyk W., Węcel G., Szlęk A.

The effect of granular temperature formulation in the two-fluid model for a turbulent fluidization of glass beads

12:45 – 13:00 Sobieski W.

The closures problem in the CFD area

13:00 – 13:15 Wardach-Święcicka I., Kardaś D.

Numerical analysis of thermal decomposition of single solid fuel particle in a stream of hot fuel gases

13:15 – 13:30 Szuszkiewicz J.

Course of products concentration of plasma pyrolysis of rubber in function of plasmatron power

13:30 – 13:45 Grucelski A.

Propagation of thermal and reaction fronts in a simple granular medium

13:45 – 14:00 Wrzesiński Z.

Changing the combustion area of powder grains in the engine of a two-chamber system

GUT Fahrenheit Courtyard + Campus Dinner Tent

14:00 – 15:00 LUNCH

Auditorium Novum

15:00 – 15:50 GENERAL LECTURE

Tvergaard V.

Finite strain analyses of deformations in polymer specimens

15:50 – 17:00 Participants' transfer to Baltic Philharmonic Hall
(buses for the Participants will be provided in front of the Gdańsk University of Technology Main Building, starting from 16:00)

Baltic Philharmonic Hall

17:00 –17:30 O.C. ZIENKIEWICZ MEDAL AWARDING CEREMONY

Baltic Philharmonic Hall

17:30 –18:30 CONCERT

Baltic Philharmonic Hall

18:30 –23:00 GALA DINNER

(buses for the Participants will be provided in front of the Baltic Philharmonic Hall starting from 22:30 – the buses will be shuttled to three destinations: Gdańsk Old Town, Gdańsk Suchanino and Gdańsk Wrzeszcz)

WEDNESDAY, SEPTEMBER 9th

Auditorium Novum

8:30 – 9:20 GENERAL LECTURE

Kurtyka T.

Advanced mechanics in High Energy Physics experiments

9:20 – 9:30 BREAK

Auditorium Novum

9:30 – 10:20 GENERAL LECTURE

Geers M., Kouznetsova V., Sridhar A., Krushynska A.

Multiscale mechanics of dynamical metamaterials

10:20 – 10:40 COFFEE BREAK

10:40 – 12:35 PARALLEL SESSIONS

Auditorium Novum MS10: Mechanics in Engineering Problems Session 1

Chair: Wilde K.

Keynote Speech

10:40 – 11:05 Miśkiewicz M., Daszkiewicz K., Ferenc T., Witkowski W., Chróścielewski J.
Validation tests and numerical simulations of full scale composite sandwich segment

11:05 – 11:20 Hołowaty J., Zimny G.
Numerical models for live load distribution in a multi-span steel-concrete composite bridge

11:20 – 11:35 Chikahiro Y., Ario I., Holnicki-Szulc J., Pawłowski P., Graczykowski C.
Study on the optimization of the reinforced scissor type bridge

11:35 – 11:50 Błachowski B., Gutkowski W., Wiśniewski P.
Dynamic substructuring approach for human induced vibration of a suspension footbridge

11:50 – 12:05 Kulpa M., Siwowski T.
Modelling and numerical analysis of GFRP composite panels of bridge deck

12:05 – 12:20 Markiewicz B., Kulpa M., Ziemiański L.
Calculated and measured dynamic properties of the FRP composite beam

12:20 – 12:35 Pozorski Z., Pozorska J.
Stress redistribution at the support of transversely loaded sandwich panel

GUT Aula MS24: Thin-Walled Structures Session 1: Shell and plate buckling

Chair: Pietraszkiewicz W.

- Keynote Speech**
- 10:40 – 11:05 Wittenbeck L., Magnucki K.
Elastic buckling of corrugated plates
- 11:05 – 11:20 Malinowski M.
Post-buckling analysis of orthotropic circular cylindrical shell with inner corrugated layer
- 11:20 – 11:35 Marcinowski J.
The role of imperfections in nonlinear buckling analysis of a spherical shell roof
- 11:35 – 11:50 Krasovsky V.L., Lykhachova O.V.
Cylindrical shells with one longitudinal cut under different conditions of axial compression
- 11:50 – 12:05 Magnucka-Blandzi E., Rodak M., Walczak Z.
Buckling and vibrations of sandwich rectangular plates with trapezoidal core and three-layer faces
- 12:05 – 12:20 Filippov S.
Buckling and optimal design of a cylindrical shell stiffened by annular plates
- 12:20 – 12:35 Jasion P., Wittenbeck L.
Numerical investigation of bending and buckling of seven-layer sandwich plates

**GUT Room 300 MS19: Probabilistic Methods in Mechanics
Session 1**

Chair: Skowronek M., Szafran J.

- Keynote Speech**
- 10:40 – 11:05 Szafran J., Juszczak K., Kamiński M.M.
Dynamic response of the steel chimney by the stochastic perturbation-based Finite Element Method
- 11:05 – 11:20 Hammoutene M., Tiliouine B., Benahmed B.
Numerical investigation of the effects of damping uncertainties on Algerian seismic code spectra by Monte Carlo simulation
- 11:20 – 11:35 Kamiński M.M., Pokusiński B.
Reliability of the axisymmetric shell structure by the response function method and the generalized stochastic perturbation technique
- 11:35 – 11:50 Kulesa A., Kurek A., Łagoda T., Achtehlik H.
The lifetime of steel specimens under strain-controlled cyclic bending
- 11:50 – 12:05 Przewłócki J., Górski J., Świdziński W.
Probabilistic analysis of a cyclically loaded soil stratum settlement
- 12:05 – 12:20 Sokołowski D., Kamiński M.M.
Stochastic Finite Element Method SORM study of the corrugated web steel plate girder
- 12:20 – 12:35 Strąkowski M., Kamiński M.M.
On bending of the steel bisymmetric I-beam profile exposed to fire

**GUT Room 200 MS10: Mechanics in Engineering Problems
Session 2**

Chair: Witkowski W.

- Keynote Speech**
- 10:40 – 11:05 Ziółkowski P.J., Ziółkowski P., Badur J.
Do we need the Aero number?

- 11:05 – 11:20 Drózdź A., Elsner W., Kępiński A.
Investigation of turbulent boundary layers at moderate Reynolds number in the vicinity of separation
- 11:20 – 11:35 Chajec W., Dziubiński A.
Modal approach in the fluid-structure interaction
- 11:35 – 11:50 Adamkowski A., Henclik S., Janicki W., Lewandowski M.
Laboratory investigation of the influence of pipeline supports stiffness on water hammer and fluid-structure interaction
- 11:50 – 12:05 Wang L., Zhong Z.
Complex modal analysis for time-variant dynamical problems of rotating pipe conveying fluid
- 12:05 – 12:20 Henclik S.
Numerical study on water hammer with fluid-structure interaction in a straight pipeline fixed with viscoelastic supports
- 12:20 – 12:35 Pawłowska A., Drobniak S., Domagała P.
Self-sustained oscillations of the axisymmetric free jet at low and moderate Reynolds number

**GUT Room 211 MS14: Multiscale Modelling of Materials and Structures
Session 3**

Chair: Kuś W., Pietrzyk M.

Keynote Speech

- 10:40 – 11:05 Perzyński K., Madej Ł.
Numerical model for brittle-ductile fracture analysis in DP steel
- 11:05 – 11:20 Graca P., Muszka K., Majta J.
Selection of the proper work hardening law for non-linear deformation conditions
- 11:20 – 11:35 Bzowski K., Bachniak D., Rauch Ł., Pietrzyk M.
The use of a statistical representation of the microstructure in multiscale modelling of deformation of TRIP steels
- 11:35 – 11:50 Pernach M., Bzowski K., Rauch Ł., Gorrochategui I.O., Pietrzyk M.
The problem of computing costs of multiscale simulation and optimization of manufacturing of rails
- 11:50 – 12:05 Sitko M., Madej Ł., Muszka K.
Concurrent CAFE model of static recrystallization during multi-pass hot rolling
- 12:05 – 12:20 Szyndler J., Madej Ł.
Material model development for numerical simulation of the incremental forming process
- 12:20 – 12:35 Misztalska E., Więckowski Z.
Application of the stress based finite element method to problems of isochoric plasticity

**GUT Room 213 MS13: Modelling and Simulation in Land Vehicles and Aircrafts
Session 1**

Chair: Mrzygłód M.

Keynote Speech

- 10:40 – 11:05 Sanecki H.
Loadings in rail vehicle due to bulk material

- 11:05 – 11:20 Sanecki H., Walczak S.
Application of structural materials of ultra-high strength in rail vehicles
- 11:20 – 11:35 Dziewiecki K., Prochowski L., Zielonka K.
Modelling and experimental investigation of the motion of a microbus passenger in the space between seat rows during a road accident
- 11:35 – 11:50 Kalinowski M.
Inverted joined-wing multidisciplinary optimization
- 11:50 – 12:05 Lis M., Dziubiński A., Galiński C., Goetzendorf-Grabowski T.
Dynamic stability analysis of the inverted joined wing scaled demonstrator
- 12:05 – 12:20 Morzyński M., Stankiewicz W., Szeliga W., Kotecki K.
Physical mode basis design for the flow past a Delta wing
- 12:20 – 12:35 Surmacz K., Ruchała P., Stryczniewicz W.
Wind tunnel tests of the development and demise of Vortex Ring State of the helicopter rotor

GUT Room 462 **MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization
Session 1: Mechanics of materials and structures – theory, optimum design and numerical methods**

Chair: John A.

- 10:40 – 10:50 **A Tribute to Prof. Joachim Telega in the 10th Anniversary of His Death**
Keynote Speech
- 10:50 – 11:15 Sofonea M., Barbotou M.
Modelling and analysis of a contact problem with unilateral constraint
- 11:15 – 11:30 Schröder J., Steeger K., Schwarz A.
Remarks on least-squares finite element formulations for hyperelasticity
- 11:30 – 11:45 Gajewski T., Stępak H., Szajek K., Łodygowski T., Stanisic M.G., Oszkinis G.
Numerical aspects of patient specific material calibration of human artery: case study using clinical data
- 11:45 – 12:00 Czarnecki S., Czubacki R., Lewiński T., Wawruch P.
The Free Material Design reduced to the Monge-Kantorovich problem
- 12:00 – 12:15 Sokołowski J., Źochowski A.
The second order shape – topological differentiability of elastic energy in domains with cracks
- 12:15 – 12:30 Myślecki K., Lewandowski J.
Modified Hu-Washizu principle as a general basis for FEM plasticity equations
- 12:30 – 12:45 Zakęś F., Śniady P.
Vibrations of multi-span frames under moving load by using modified Finite Element Method

GUT Room 167 **MS15: Numerical Modelling in Hydraulic Fracturing and Related Problems
Session 1**

Chair: Mishuris G.

- Keynote Speech**
- 10:40 – 11:05 Linkov A.M.
Modified theory, universal asymptotic umbrella and efficient simulation of hydraulic fracturing
- 11:05 – 11:20 Dobroskok A., Linkov A.M., Rybarska-Rusinek L.
On simulation and interpretation of seismicity accompanying hydraulic fractures

- 11:20 – 11:35 Grabski J.K., Kołodziej J.A.
Generalized Newtonian fluid flow and heat transfer in an internally finned tube
- 11:35 – 11:50 Jaworski D., Linkov A.M., Rybarska-Rusinek L.
Almost analytical evaluation of influence coefficients for ordinary and edge power-type boundary elements
- 11:50 – 12:05 Tuliszką-Sznitko E., Kiełczewski K.
Taylor-Couette flow with radial temperature gradient

**IFFM of PAS Aula MS07: LBM, Meshless and Related Methods in Computational Fluid and Solid Mechanics
Session 1**

Chair: Pozorski J.

- 10:40 – 10:50 **A Tribute to Prof. Janusz Orkisz
in connection with His 80th Birthday and in the recognition
of important scientific achievements in Mechanics**
- Keynote Speech**
- 10:50 – 11:15 Cecot W., Milewski S., Orkisz J.
Measurement aided computation of extensible cable deflections
- 11:15 – 11:30 Jaśkowiec J., Milewski S.
Coupling of Finite Element Method and meshless finite difference method with nonconforming approximation orders
- 11:30 – 11:45 Jaworska I., Orkisz J.
On the application of multipoint meshless method to the nonlinear analysis
- 11:45 – 12:00 Kudela H.
Collapse vortices and filamentary structures
- 12:00 – 12:15 Kudela H., Kosior A.
Vortex-in-cell method and parallel computations
- 12:15 – 12:30 Bohdal Ł., Patyk R.
A mesh-free particle model for simulation of trimming of aluminum alloy sheet

12:35 – 13:00 COFFEE BREAK

13:00 – 14:00 POSTER SESSION

Posters assigned to MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization

Gzik M., Wolański W., Gzik-Zroska B., Jozsko K., Burkacki M., Suchoń S.
The impact of ergonomic factors influencing armoured vehicle crew safety

Jozsko K., Gzik M., Wolański W., Gzik-Zroska B., Burkacki M., Suchoń S., Muszyński A., Zielonka K.
Safety analysis of passengers of public transport during frontal impact

Posters assigned to MS10: Mechanics in Engineering Problems

Ambroziak A.
Experimental tests for the determination of mechanical properties of PVC foil

Buśkiewicz J.
Geometric analysis of a 1-DOF, six-link feeder

Chróścielewski J., Witkowski W., Sobczyk B., Sabik A.
First ply failure FEA of laminated shells undergoing large displacements – 6 parameter shell theory approach

- Dalewski R.T., Józwiak R., Kobyliński O., Rafał K., Szumbariski J.
Design of a low power wind turbine adjusted to near-ground higher turbulence
- Flis L.
Static and dynamic accidental load analysis of Jet Hoods
- Grębowski K., Hirsz M., Nadolny A., Wilde K.
Parametric analysis of Istanbul's Ring Road viaduct for three levels of seismic load
- Grzejda R.
New method of modelling nonlinear multi-bolted systems
- Jamroz K., Burzyński S., Witkowski W., Wilde K., Bagiński G.
Numerical methods for the assessment of bridge safety barriers
- Korczak S.
Dynamics of underactuated mechanical systems in control task
- Lasowicz N., Jankowski R.
Numerical analysis on the effectiveness of polymer element in reduction of temporary steel grandstand vibrations under crowd load
- Madaj A., Siekierski W.
Identification of defect factors for a road bridge made of pre-stressed concrete on the basis of static strength analysis
- Mariak A., Miśkiewicz M., Meronk B., Wilde K.
Reference FEM model for SHM system of cable-stayed bridge in Rzeszów
- Melcer J.
Numerical simulation of moving load effect on pavements
- Meronk B., Wilde K.
Ultrasonic modulated waves for diagnostics of concrete, experimental study
- Miśkiewicz M., Pyrzowski Ł., Wilde K., Chróścielewski J.
Numerical analysis and in situ tests of Grot Rowecki bridge in Warsaw
- Noga S., Bogacz R.
On vibration analysis of wheel composed of ring and plate as an elastic foundation
- Piekarska W., Kubiak M.
Numerical prediction of fusion zone and heat affected zone in Yb:YAG laser heating process with experimental verification
- Pyrzowski Ł., Sobczyk B., Witkowski W., Chróścielewski J.
Three-point bending test of sandwich beams supporting the GFRP footbridge design process – validation analysis
- Robak A., Błazik-Borowa E., Bęc J.
Numerical analysis of scaffolding stands with defects
- Smakosz Ł., Kreja I.
Experimental and numerical evaluation of mechanical behaviour of composite structural insulated wall panels submitted to edgewise compression
- Strzelecka K., Kudela H., Filarowska A.
Quantitative and qualitative researches of flow around a bridge pillar model for the Reynolds number of transitional and turbulent flow
- Szewczyk P., Szumigala M.
The numerical and experimental study of welding strains in the element under the load
- Szumigala M., Ciesielczyk K.
Numerical analysis of the beam to column end – plate bolted connection

Szumigała M., Polus Ł.

Numerical analysis of resistance of the aluminium and concrete composite beam with shear connectors created as solid elements

Waszczuk-Młyńska A., Radkowski S.

Circular membrane as a voltage signal generator

Zielińska M., Rucka M.

Diagnostics of historic columns using wave propagation

Posters assigned to MS24: Thin-Walled Structures

Adamowicz A.

Thermo-mechanical stresses in a brake disc

Chwiałkowska K., Garstecki A., Rzeszut K.

Stability FEM analysis of steel members restrained by sheeting accounting for imperfections

Chybiński M., Garstecki A.

Influence of rib configuration on stability of thin walled steel beams

Grigorenko Y., Bepalova E., Urusova G.

Some features of vibrations of compound shells of revolution

Krajewski M., Iwicki P., Sałyk N.

Analysis of sloping brace stiffness influence on stability and load bearing capacity of a truss

Mańkowski J.

Numerical simulation of micro-slip occurring in riveted joints of semi monocoque structures

Mańkowski J.

Numerical simulations and experimental of work riveted joints occurring in semi monocoque structures

Mijušković O., Tugić L., Šćepanović B.

Analytical solution to buckling problems of plates with different boundary conditions under combination of patch load and bending

Tertel E.

Buckling of sandwich conical shells including the plasticity and unloading

Żmuda-Trzebiatowski Ł., Iwicki P., Krajewski M.

Investigation of stability and limit load of a truss overhead opened bridge

GUT Fahrenheit Courtyard + Campus Dinner Tent

14:00 – 15:00 LUNCH

Auditorium Novum

15:00 – 15:50 GENERAL LECTURE

Ambrósio J.

Interaction between mechanical systems and continuum mechanical models in the framework of biomechanics and vehicle dynamics

15:50 – 16:00 BREAK

16:00 – 17:30 PARALLEL SESSIONS

**Auditorium Novum MS10: Mechanics in Engineering Problems
Session 3**

Chair: Żak A.

- 16:00 – 16:15 Kasprzak T., Konderla P., Kutylowski R., Waśniewski G.
A method of estimating the stability coefficient of a considerably degraded cooling tower
- 16:15 – 16:30 Iwicki P., Wójcik M., Sondej M., Rejowski K., Kuczyńska N., Tejchman J.
FE analyses on buckling of cylindrical silos composed of horizontally corrugated sheets
- 16:30 – 16:45 Wrana B., Pietrzak N.
Deformation analysis of the Kościuszko Mound in Cracow
- 16:45 – 17:00 Ossowski R., Szarf K.
Impact of an unsecured excavation on an underground pipeline
- 17:00 – 17:15 Czado B., Wrana B.
Method of prediction of load-settlement curve for a single pile
- 17:15 – 17:30 Bukala J., Damaziak K., Kroszczyński K., Krzeszowiec M., Małachowski J., Sobczak K.
Analysis approach for a diffusor augmented small wind turbine rotor
- 17:30 – 17:45 Nazarko P., Ziemiański L., Noga S., Markowski T.
Comparative analysis of compound annular plates vibration on the basis of numerical and experimental studies

**GUT Aula MS24: Thin-Walled Structures
Session 2: Theory of shells and plates**

Chair: Jędrysiak J.

- 16:00 – 16:15 Vaysfeld N., Popov G.
Bending of a rectangular thick plate with respect to its proper weight
- 16:15 – 16:30 Pietraszkiewicz W.
On the resultant six-field linear theory of elastic shells
- 16:30 – 16:45 Dai H.H., Song Z.
A consistent plate theory for compressible hyperelastic materials
- 16:45 – 17:00 Taczała M., Buczkowski R., Kleiber M.
Nonlinear analysis of functionally graded plates resting on elastic foundation using the higher order plate theory
- 17:00 – 17:15 Eremeyev V.A., Altenbach H.
On the plates and shells with initial surface stresses
- 17:15 – 17:30 Lychev S., Lycheva T.
Theoretical and experimental study of thin-walled growing laminated structures
- 17:30 – 17:45 Grobbelaar M.
Stabilization of a magneto-elastic Mindlin-Timoshenko plate model

**GUT Room 300 MS19: Probabilistic Methods in Mechanics
Session 2**

Chair: Skowronek M., Szafran J.

- 16:00 – 16:15 Gajewski J., Mikulski T.
Structural sensitivity analysis of telecommunication tower

- 16:15 – 16:30 Sorn P., Górski J., Winkelmann K., Przewłócki J.
Discrete random variables in reliability calculations of a reticulated shell
- 16:30 – 16:45 Tiliouine B., Chemali B., Hammoutene M.
Second order statistics of dynamic response of structures with lognormality distributed damping
- 16:45 – 17:00 Winkelmann K., Bosch J., Górski J.
Structural reliability of overhead power lines by means of Monte Carlo Method and RSM
- 17:00 – 17:15 Winkelmann K., Oziębło M.
Reliability assessment of truss towers using Monte Carlo Method, FEM and RSM

GUT Room 200 **MS10: Mechanics in Engineering Problems**
Session 4

Chair: Krawczuk M.

- 16:00 – 16:15 Gilewski W., Pełczyński J.
Truss model of origami inspired folded structures
- 16:15 – 16:30 Al Sabouni-Zawadzka A., Gilewski W.
Technical coefficients for continuum models of orthotropic tensegrity modules
- 16:30 – 16:45 Gilewski W., Kłosowska J., Obara P.
Form finding of tensegrity structures via singular value decomposition of compatibility matrix
- 16:45 – 17:00 Pajor M., Zapłata J.
The influence of presumed border conditions on FEM thermal analysis results based on the example of an LNG tank support saddle
- 17:00 – 17:15 Okrajni J., Twardawa M., Marek A.
Thermo-mechanical fatigue of power plant components
- 17:15 – 17:30 Mleczek A., Kłosowski P.
Numerical analysis of the carpentry joints applied in traditional wooden structures

GUT Room 211 **MS14: Multiscale Modelling of Materials and Structures**
Session 4

Chair: Burczyński T., Madej Ł.

Keynote Speech

- 16:00 – 16:25 Majewski M., Hołobut P., Kurska M., Kowalczyk-Gajewska K.
Description of packing and size effects in particulate composites by micromechanical averaging schemes and computational homogenization
- 16:25 – 16:40 Dłużewski P., Tauzowski P.
FE modelling of residual stresses and void formation observed during the growth of semiconductor layers
- 16:40 – 16:55 Majchrzak E., Dziatkiewicz J.
Modelling phase changes in thin metal film subjected to ultrafast laser heating using the two-temperature model
- 16:55 – 17:10 Rylko N.
Fractal behavior of the heat flux on the boundary of random composites
- 17:10 – 17:25 Wiącek J., Molenda M.
Geometric and mechanical Representative Elementary Volume for polydisperse granular materials

GUT Room 213 **MS21: Smart Material Systems and Structures**
Session 3

Chair: Szefer G.

- 16:00 – 16:15 Dobry M.W.
Energy efficiency of vibroisolation with constant reaction force (VCRF)
- 16:15 – 16:30 Pisarski D., Bajer C.I., Dyniewicz B.
Semi-active stabilization of smart structures subjected to impact excitation
- 16:30 – 16:45 Łasecka-Plura M., Lewandowski R.
Frequency response function of structures with viscoelastic dampers and its design sensitivity analysis
- 16:45 – 17:00 Szmidt T., Bajer C.I.
Finite displacement dynamic model of twin beams with controllable damper
- 17:00 – 17:15 Olszewska A., Pawlak Z.
Influence of geometrical and physical irregularities on dynamic characteristics of a passively damped structure
- 17:15 – 17:30 Kęćik K., Mitura A.
Influence of active elements on the pendulum's rotational motion for energy harvesting

GUT Room 462 **MS16: Optimization of Structural Topology**
Session 3: Problems

Chair: Sokół T.

Keynote Speech

- 16:00 – 16:25 Czarnecki S., Czubacki R., Wawruch P.
Stress based version of isotropic material design in two dimensions
- 16:25 – 16:40 Czarnecki S., Czubacki R., Lewiński T.
Topology optimization of spatial continuum structures made of a non-homogeneous material of cubic symmetry
- 16:40 – 16:55 Idczak E., Stręk T.
Optimization of auxetic structures using MMA algorithm
- 16:55 – 17:10 Pazdanowski M.J.
On the decreasing of the optimization problem size
- 17:10 – 17:25 Volkova V.E.
Phase trajectories of non-linear noised dynamic system
- 17:25 – 17:40 Bitzas G., Stavroulakis G.E.
Design and topology optimization of an aluminium alloy wheel

GUT Room 167 **MS15: Numerical Modelling in Hydraulic Fracturing and Related Problems**
Session 2

Chair: Linkov A.M.

Keynote Speech

- 16:00 – 16:25 Mishuris G., Wróbel M.
Numerical simulation of hydraulic fracture: particle velocity based approach
- 16:25 – 16:40 Perkowska M., Mishuris G., Wróbel M.
Numerical modeling of hydraulic fractures for non-Newtonian fluids
- 16:40 – 16:55 Rejwer E., Jaworski D.
On propagation of closely located hydraulic fractures

16:55 – 17:10 Steller J.
Cavitation resistance of structural materials according to the fractional approach

**IFFM of PAS Aula MS07: LBM, Meshless and Related Methods in Computational Fluid and Solid Mechanics
Session 2**

Chair: Szumbariski J.

Keynote Speech

16:00 – 16:25 Regulski W., Szumbariski J., Łaniewski-WoŃk Ł., Gumowski K., Skibiński J., Wichrowski M.

Highly resolved LBM flow simulations in ceramic foams with experimental verification

16:25 – 16:40 Dzikowski M., Rokicki J.

Accuracy of LBM in application to multiphase tribological flows

16:40 – 16:55 Grucelski A., Pozorski J.

A numerical scheme of shift-periodic boundary condition for LBM

16:55 – 17:10 Piasecka-Belkhat A., Korczak A.

Modelling of transient heat transport in a two-layered crystalline solid films using the interval Lattice Boltzmann Method

17:10 – 17:25 Walczak T., Sypniewska-Kamińska G.

The method of fundamental solutions with optimization of source intensities approach

17:30 – 17:50 COFFEE BREAK

17:50 – 19:20 PARALLEL SESSIONS

**Auditorium Novum MS03: Computational Mechanics of Concrete and Geomaterials
Session 3**

Chair: Pamin J.

17:50 – 18:05 Cichocki K., Ruchwa M.

Distribution of damage in unconventionally reinforced concrete slabs subjected to impact loads

18:05 – 18:20 Kotarski A., Więckowski Z.

Two-dimensional FE analysis of confined concrete column

18:20 – 18:35 Jankowiak I.

XFEM analysis of intermediate crack debonding of FRP strengthened RC beams

18:35 – 18:50 Bobiński J., Tejchman J.

Simulations of cracks in concrete with gradual transition from continuous to discontinuous description

18:50 – 19:05 Korol E., Tejchman J.

FE analyses of a coupled energetic-statistical size effect in concrete beams under bending

19:05 – 19:20 Wosatko A., Genikomsou A., Pamin J., Polak M.A., Winnicki A.

Incorporation of crack closure effect in damage-plasticity models

GUT Aula **MS24: Thin-Walled Structures**
Session 3: Numerical methods

Chair: Witkowski W.

- 17:50 – 18:05 Eisenträger J., Naumenko K., Altenbach H.
A layer-wise user element for the analysis of photovoltaic modules
- 18:05 – 18:20 Fialko S.
Quadrilateral finite element for analysis of reinforced concrete structures
- 18:20 – 18:35 Tarczewski R., Święciak M.
Topological optimization of formworks meshes for free-form surfaces
- 18:35 – 18:50 Perelmuter A., Yurchenko V.
Shear stresses in hybrid thin-walled section: development of detail numerical algorithm based on the graph theory
- 18:50 – 19:05 Sauer R.A., Duong T.X., Mandadapu K.K., Steigmann D.J.
A computational formulation for liquid shells based on C1-continuous finite elements
- 19:05 – 19:20 Daszkiewicz K., Chróścielewski J., Witkowski W.
Global postbuckling analysis of functionally graded box section cantilever

GUT Room 300 **MS17: Physics Based Modelling in Solid Mechanics**
Session 3: Mechanical/Physical Properties of Materials

Chair: Pęcherski R.B., Kowalczyk-Gajewska K.

- 17:50 – 18:05 Berinskii I., Altenbach H.
Dependence of the elastic properties of two-dimensional crystals on their curvature
- 18:05 – 18:20 Bolzon G., Pandi P.
The influence of imperfect interfaces on the overall mechanical response of metal-matrix composites
- 18:20 – 18:35 Radvilaite U., Kacianauskas R., Rusakevicius D.
Application of spherical harmonics to symmetric non-spherical particles description
- 18:35 – 18:50 Peck D., Mishuris G., Wróbel M., Petrov Y.
An improved estimate for threshold fracture energy in solid particle erosion
- 18:50 – 19:05 Waszkowiak W., Żak A., Krawczuk M.
Modelling of periodic structures by spectral finite elements

GUT Room 200 **MS04: Contact Mechanics**
Session 3

Chair: Litewka P.

- 17:50 – 18:05 Myśliński A., Chudzikiewicz A.
Rolling contact problems for plastically graded materials
- 18:05 – 18:20 Zmitrowicz A.
Development of friction constitutive relations for polymers
- 18:20 – 18:35 Bąk Ł., Stachowicz F., Trzepieciński T., Bosiakov S., Rogosin S.
Strain hardening effect on elastic-plastic contact of a rigid sphere against a deformable flat

- 18:35 – 18:50 Chodór J., Żurawski Ł.
Investigations on the chip shape and its upsetting and shortening ratios and surface roughness in partial symmetric face milling process of aluminium alloy AW-7075 and the simulation of the process with the use of FEM

**GUT Room 211 MS14: Multiscale Modelling of Materials and Structures
Session 5**

Chair: Burczyński T., Kuś W.

- 17:50 – 18:05 Ratajczak M., Będziński R.
The use of numerical studies in the assessment of mechanical characteristics of the highly deformable structures of the head
- 18:05 – 18:20 Kuś W., Górecki D., Makowski P.
Stochastic multiscale analysis of bioscaffolds
- 18:20 – 18:35 Makowski P., Kuś W.
Multiscale model of the proximal femur with implanted bone scaffold
- 18:35 – 18:50 Wierszycki M., Szajek K., Łodygowski T., Nowak M.
Numerical verification of two-scale approach for cancellous bone modelling

**GUT Room 213 MS21: Smart Material Systems and Structures
Session 4**

Chair: Stavroulakis G.E.

- 17:50 – 18:05 Kurnik W., Perek A., Przybyłowicz P.M.
Double-source flutter in a discrete-continuous rotor/bearing system with magnetic fluid
- 18:05 – 18:20 Weremczuk A., Warmiński J., Rusinek R.
The influence of external excitation on the dynamics of milling process
- 18:20 – 18:35 Abu-Salih S.
An analytical study of electromechanical buckling of micro spherical thin film bonded to a spherical compliant substrate
- 18:35 – 18:50 Widłaszewski J.
Mechanism of bi-direction laser bending for micro systems

**GUT Room 462 MS16: Optimization of Structural Topology
Session 4: Applications**

Chair: Bochenek B.

Keynote Speech

- 17:50 – 18:15 Nowak M.S., Hausa H., Roszak R., Morzyński M., Brudło K.
Biomimetic optimisation – new approach to aircraft structural design
- 18:15 – 18:30 Kutylowski R., Szwechłowicz M.
Topology optimization as a tool for road pavement structure analysis
- 18:30 – 18:45 Kuczek T.
Application of manufacturing constraints method to structural optimization of AEC thin-walled structures

**IFFM of PAS Aula MS07: LBM, Meshless and Related Methods in Computational Fluid
and Solid Mechanics
Session 3**

Chair: Kudela H.

Keynote Speech

- 17:50 – 18:15 Więckowski Z.
Landslide modelling by the material point method
- 18:15 – 18:30 Nowicki T.
Discrete Element Method in the influence study of faults of concrete specimens on uniaxial compression test
- 18:30 – 18:45 Tria D.E., Trębiński R., Janiszewski J.
On the elaboration of a methodology to experimentally verify terminal ballistics models for small arms ammunition
- 18:45 – 19:00 Szewc K., Walczewska-Szewc K., Olejnik M.
Is the motion of a single SPH particle droplet/solid physically correct?
- 19:00 – 19:15 Olejnik M., Szewc K., Pozorski J.
Application of the Okubo-Weiss parameter to dynamical resolution adjustment in the Smoothed Particle Hydrodynamics approach

19:20 – 19:30 BREAK

GUT Senate Room

19:30 – 20:00 PACM GENERAL ASSEMBLY

THURSDAY, SEPTEMBER 10th

Auditorium Novum

8:30 – 9:20 GENERAL LECTURE

Kowalewski T.A., Nakielski P., Pierini F., Zembrzycki K., Pawłowska S.
Nanoscale challenges of fluid mechanics

9:20 – 9:30 BREAK

Auditorium Novum

9:30 – 10:20 GENERAL LECTURE

Soldati A.
*Physics and computations of turbulent dispersed flows
– macro - consequences from micro - interactions*

10:20 – 10:40 COFFEE BREAK

10:40 – 12:35 PARALLEL SESSIONS

Auditorium Novum MS10: Mechanics in Engineering Problems Session 5

Chair: Lewandowski R.

Keynote Speech

10:40 – 11:05 Doliński Ł., Krawczuk M., Palacz M., Żak A.
Detection of damages in a riveted plate

11:05 – 11:20 Doliński Ł., Krawczuk M.
Application of experimental modal analysis and wavelet transformation for damage localisation in a composite wind turbine blade

11:20 – 11:35 Ziopaja K.
Effectiveness of damage detection in 3-D structures using discrete wavelet transformation

11:35 – 11:50 Lachowicz J., Rucka M.
GPR simulation for diagnostics of reinforced concrete structures

11:50 – 12:05 Kędra R., Rucka M.
Wave propagation for diagnostics of connections in steel structures

12:05 – 12:20 Zima B., Rucka M.
Experimental and numerical analysis of wave propagation in ground anchors

12:20 – 12:35 Nalepka M., Zembaty Z., Kokot S.
Experimental evaluation of wavelet based damage monitoring of a reinforced concrete frame

GUT Aula MS24: Thin-Walled Structures Session 4: Dynamic problems

Chair: Mania R.

- Keynote Speech**
- 10:40 – 11:05 Korobeynikov S.N., Alyokhin V.V., Annin B.D., Babichev A.V.
Dynamic buckling simulation of single-layer graphene sheets by the molecular mechanics method
- 11:05 – 11:20 Pawlus D.
Dynamic response of an annular plate with a variable three-layered structure
- 11:20 – 11:35 Sarkabiri B., Jahan A., Rezvani M.J.
Multi-objective crashworthiness optimization of thin-walled conical groove tubes filled with polyurethane foam
- 11:35 – 11:50 Tylikowski A.
Stability of hybrid rotating shaft with imperfect boundary conditions
- 11:50 – 12:05 Latański J., Warmiński J.
Dynamics of a rotating thin-walled composite beam mounted on in-plane moving hub
- 12:05 – 12:20 Ermis M., Eratli N., Omurtag M.H.
The effect of the impulsive dynamic loads on the barrel type helicoidal bars
- 12:20 – 12:35 Cekus D., Posiadała B., Waryś P.
Procedure for automatic solution of free vibration problem of Timoshenko beam with attachments
- 12:35 – 12:50 Kołakowski Z., Kotelko M.
Dynamic buckling and dynamic progressive buckling of open-section columns

**GUT Room 300 MS02: Axially Moving Structures
Session 1**

Chair: Vetyukov Y.

- Keynote Speech**
- 10:40 – 11:05 Vetyukov Y., Gruber P.G., Krommer M.
Modeling finite deformations of an axially moving elastic plate with a mixed Eulerian-Lagrangian kinematic description
- 11:05 – 11:20 Gruber P.G., Vetyukov Y., Krommer M.
Plastic deformation of axially moving continuum in mixed Eulerian-Lagrangian formulation
- 11:20 – 11:35 Baumgart M., Steinboeck A., Saxinger M., Kugi A.
Elasto-plastic bending of steel strip in a hot-dip galvanizing line
- 11:35 – 11:50 Humer A., Vu-Quoc L., Steinbrecher I.
Complete modeling of the dynamics of sliding beams with large deformation
- 11:50 – 12:05 Ritzberger D., Schirrer A., Jakubek S.
Formulating the perfectly matched layer as a control optimization problem
- 12:05 – 12:20 Rusin J.
Vibrations of a double-beam complex system subjected to a moving force
- 12:20 – 12:35 Thonhofer E., Jakubek S.
Online parameter identification for traffic simulation via Eulerian and Lagrangian sensing

**GUT Room 200 MS10: Mechanics in Engineering Problems
Session 6**

Chair: Kutyłowski R.

- Keynote Speech**
- 10:40 – 11:05 Venier A., Garbowski T.
Reliable mechanical characterization of layered pavement structures
- 11:05 – 11:20 Badur J., Chróścielewski J.
On a four-time unification of Cosserat continua by the intrinsic approach
- 11:20 – 11:35 Kovacevic S., Markovic N.
A numerical analysis of the ultimate strength of longitudinally unstiffened girders subjected to patch loading
- 11:35 – 11:50 Okulik T., Powałka B., Parus A.
Modelling and stiffness control of piezoelectric actuators in an active vibration control system in thin wall machining
- 11:50 – 12:05 Harlecki A., Urbaś A.
Dynamics of the RUSP linkage mechanism with friction in the joints
- 12:05 – 12:20 Jarzębski P., Wiśniewski K.
On calculation of effective material properties using RVE method by parallelized FE code for shell applications
- 12:20 – 12:35 Grygorowicz M., Jasion P., Magnucki K., Paczos P.
Strength and elastic buckling of a shell of revolution with meridian in the versiera of Agnesi shape

GUT Room 211 MS22: Soft Methods and Inverse Analysis in Mechanics of Structures and Materials Session 1

Chair: Burczyński T., Ziemiański L.

- 10:40 – 10:50 **A Tribute to Prof. Zenon Waszczyszyn in connection with His 80th Birthday and in the recognition of important scientific achievements in Mechanics**
- Keynote Speech**
- 10:50 – 11:20 Waszczyszyn Z.
Identification of material parameters in thin elastic plates: basic problems of neural networks and Lamb waves applications
- 11:20 – 11:35 Jurek M., Ziemiański L.
Damage detection and evaluation in GFRP strip based on elastic wave propagation and support vector machines classification
- 11:35 – 11:50 Słoński M.
On-line identification of elastic parameters in composite laminates using Lamb waves
- 11:50 – 12:05 Orkisz J., Głowacki M.
On improving evolutionary algorithms applied to chosen problems of mechanics
- 12:05 – 12:20 Długosz A., Jarosz P.
Multiobjective optimization of electrothermal microactuators by means of Immune Game Theory MultiObjective Algorithm
- 12:20 – 12:35 Psiuk K.
Event-driven approximate reasoning

GUT Room 213 MS20: Safety and Reliability of Structures Session 1

Chair: Łodygowski T., Małachowski J.

- Keynote Speech**
- 10:40 – 11:10 Hostikka S.
Advances in the computation of fires interacting with structures
- 11:10 – 11:25 Roy A., Hendriks M.A.N., Steenbergen R., De Boer A.
Reliability analysis of reinforced concrete structures: a comparative study
- 11:25 – 11:40 Kokot S.
Progressive collapse of a reinforced concrete flat slab frame under column removal
- 11:40 – 11:55 Sielicki P.W., Łodygowski T., Stachowski M.
Online prediction method of the blast pressure loading for structural and personnel safety
- 11:55 – 12:10 Malendowski M., Glema A., Szymkuć W.
Verification and validation of thermal and mechanical response of steel beams according to selected fire exposures and various numerical approaches
- 12:10 – 12:25 Szymkuć W., Glema A., Malendowski M.
Fire performance of composite concrete filled tubular columns exposed to localized fire
- 12:25 – 12:40 Tran C.
Parallel computing using Multi Processor System-on-Chip (MPSoC) for structural damage detection in real time

**GUT Room 462 MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization
Session 2: Bioheat and biophysics**

Chair: Sofonea M.

- Keynote Speech**
- 10:40 – 11:05 Kapanadze D., Mishuris G., Pesetskaya E.
Remarks on effective conductivity of nonlinear 2D doubly periodic composites
- 11:05 – 11:20 Gluzman S., Mityushev V., Nawalaniec W.
Effective conductivity and critical properties of 2D composites
- 11:20 – 11:35 Gambin B., Kruglenko E., Secomski W., Karwat P.
Temperature dependencies of ultrasound signals backscattered from an agar-oil soft-tissue mimicking material
- 11:35 – 11:50 Majchrzak E., Turchan Ł., Kałuża G.
Sensitivity analysis of temperature field in the heated tissue with respect to the dual-phase-lag model parameters
- 11:50 – 12:05 Veremeichik A., Garbachevsky V., Khvisevitch V., Rakhuba V.
Numerical realization of boundary integral equation method for solving two-dimensional non-stationary problems of thermoelasticity
- 12:05 – 12:20 Wodarski P., Michnik R., Jurkojć J., Bieniek A., Gzik M.
Interactive application using virtual reality technology for supporting of diagnostic process of upper limbs
- 12:20 – 12:35 Gambin B., Kruglenko E., Byra M., Nowicki A., Piotrkowska-Wróblewska H., Dobruch-Sobczak K.
Changes in ultrasound echoes of a breast tissue in vivo after exposure to heat – a case study

**GUT Room 167 MS05: Experimental Mechanics and Thermomechanics of Materials
Related to Phase Transformation
Session 1**

Chair: Pieczyska E.

- Prolonged Speech**
10:40 – 11:00 Pieczyska E., Maj M., Furuta T., Kuramoto S.
Gum Metal – unique properties and results of initial investigation of the new titanium alloy
- Prolonged Speech**
11:00 – 11:20 Takeda K., Matsui R., Tobushi H., Pieczyska E.
Transformation-induced creep and relaxation of TiNi shape memory alloy
- Prolonged Speech**
11:20 – 11:40 Zheng L., He Y., Moumni Z.
Frequency-dependent temperature and strain evolutions of NiTi wire during cyclic stress-controlled martensitic transformation
- 11:40 – 11:55 Takeda K., Matsui R., Tobushi H., Levintant-Zayonts N., Kucharski S.
Influence of nitrogen ion implantation on fatigue of a TiNi shape memory alloy tape
- 11:55 – 12:10 Krzysiak A.
Experimental investigation of the innovative flow control blowing devices
- 12:10 – 12:25 Staszczak M., Pieczyska E., Maj M., Kowalczyk-Gajewska K., Cristea M., Tobushi H., Hayashi S.
Shape memory polymer – shape fixity and recovery in cyclic loading
- 12:25 – 12:40 Szymczak T., Kowalewski Z.L., Brodecki A.
An influence of notch type on material behaviour under monotonic tension

IFFM of PAS Aula MS12. Modelling and Simulating Disperse Two-Phase Flows Session 1

Chair: Pozorski J.

- Keynote Speech**
10:40 – 11:05 Marchioli C., Soldati A.
Turbulent breakage of ductile aggregates
- 11:05 – 11:20 Tiutiurski P., Kardaś D., Wardach-Święcicka I.
CFD simulation of two-phase flow in the bearing chamber
- 11:20 – 11:35 Kornet S., Badur J.
Partial evaporation and total cut-off wet steam region on the shock wave
- 11:35 – 11:50 Henry C., Minier J.
A stochastic approach for the deposition and resuspension of complex multilayered structures

12:35 – 13:00 COFFEE BREAK

13:00 – 14:00 POSTER SESSION

Posters assigned to MS03: Computational Mechanics of Concrete and Geomaterials

Alawdin P., Mordich A.I., Muzychkin J.A.
Experimental and numerical analysis of precast-monolithic building floors under in-plane loading

Wojciechowski M.
Numerical homogenisation of permeability coefficient for Darcy flow in porous media

Posters assigned to MS04: Contact Mechanics

Jedliński T.I., Buśkiewicz J.

Analysis of the influence of differences in strength parameters of steel S235 on passive safety of lighting columns

Patyk R., Bohdal Ł.

Analysis of contact pressures in embossing process of regular asperities of surface

Posters assigned to MS05: Experimental Mechanics and Thermomechanics of Materials Related to Phase Transformation

Kukla D., Staszczak M., Pieczyska E., Heljak M., Szlązak K., Świąszkowski W., Cristea M., Tobushi H., Hayashi S.

Evaluation of the properties of polymeric foams with shape memory under load

Zajac M.M., Karwacki J., Kwidziński R.

Numerical and experimental analysis of a cool thermal storage unit

Posters assigned to MS06: Isogeometric Analysis and Applications

Kacprzyk Z., Ostapska-Łuczowska K.

Available numerical implementations of isogeometric analysis

Łuczowski M., Ostapska-Łuczowska K., Cecot W.

Comparison of IGA and FEM for the Poisson benchmark PDE

Posters assigned to MS07: LBM, Meshless and Related Methods in Computational Fluid and Solid Mechanics

Kozłowski T., Kudela H.

Flow patterns generated by a flapping airfoil

Mierzwiczak M.

The meshless procedure for the stream function-vorticity formulation of the Navier-Stokes equations

Posters assigned to MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization

Adeleye O., Fakinlede O., Ajiboye J., Adegbulugbe C.

Viscoelastic-viscoplastic material model for nonlinear deformation of dental resin composites

Alawdin P., Marcinowski J.

Analytical solution and numerical simulation of borehole ground heat exchangers for geothermal heat pump systems: ground influence zone

Paruch M.

Cancer ablation during RF hyperthermia using internal electrode

Słowiński J.J., Czarnecka A.

Numerical simulation of the traction process in the treatment for Robin Sequence

Walczak T., Grabski J.K., Grajewska M., Michałowska M.

Application of artificial neural networks in man's gait recognition

Posters assigned to MS11: Mechanics of Complex Materials, Structures and Processes

Awrejcewicz J., Starosta R., Sypniewska-Kamińska G.

Regular vibration of the oscillator with two nonlinear serially connected springs – asymptotic approach

Bąk Ł., Noga S., Stachowicz F.

Numerical and experimental analysis of the screen operation in the parametric resonance conditions

Bucior M., Gałda L., Stachowicz F., Zielecki W.

The effect of technological parameters of shot peening on surface roughness of 51CrV4 steel

Poński M., Pokorska I.

Discontinuous Galerkin method for cracked solids with chemical compositions

Skrzat A., Stachowicz F., Sevostianov I.

Numerical and experimental prediction of the yield condition for porous materials

Posters assigned to MS13: Modelling and Simulation in Land Vehicles and Aircrafts

Guzowski S., Michnej M.

Fretting wear simulation in model studies

Magiera J.

A comparative study of the performance of the 4-slice Transverse/Oblique Slicing method for analysis of 3D residual stress in prismatic bodies

Posters assigned to MS16: Optimization of Structural Topology

Borsuk G., Dobrowolski B., Tomaszewska B.

Numerical study of slotted orifices shape influence on the downstream pressure distribution

Savchenko O.

Optimization of dynamic characteristics of composite shells by using genetic algorithms

Poster assigned to MS17: Physics Based Modelling in Solid Mechanics

Kukla D., Kowalewski Z.L.

Influence of aluminum layer thickness on the fatigue properties of super-nickel alloy

Posters assigned to MS18: Porous Materials - Theory, Numerical Simulations and Experiments

Cieszko M., Kempński M.

Application of capillary and random chain models in mercury intrusion porosimetry

Faściszewski Ł., Łodygowski T., Jankowiak T.

Numerical modelling of aluminium foam based on quasi-static compression test

Grabski J.K., Mierzwiczak M.

Creeping flow of a power-law fluid through a fibrous porous media

Kazimierska-Drobny K., Kaczmarek M.

Chemo-mechanical and thermal behaviour of PVA hydrogels

Posters assigned to MS19: Probabilistic Methods in Mechanics

Böhm E., Kurek M., Łagoda T.

Fatigue life assessment with the use of exponential and power law functions for variable amplitude loading

Dudzik A., Radoń U.

The reliability assessment of a steel industrial hall

Sołtysik B., Jankowski R.

Influence of separation gap on the response of colliding models of steel structures under seismic and paraseismic excitations

Poster assigned to MS20: Safety and Reliability of Structures

Stanisławek S., Sławiński G.

The influence of utilizing different materials and their configurations on ballistic panels blast resistance

Posters assigned to MS22: Soft Methods and Inverse Analysis in Mechanics of Structures and Materials

Drelich R., Piwakowski B., Kaczmarek M.

Influence of frequency range of surface waves on estimation of parameters of heterogeneous concrete using non-contact method

Duda S., Gąsiorek D., Gembalczyk G., Kciuk S., Mężyk A.
Design of fuzzy logic controller for a unloading system in mechatronic device for gait reeducation

Poster assigned to MS23: Theoretical, Computational and Experimental Mechanics for Coupled Field Problems and Multiphase Materials

Stąpór P.
Modelling the solidification of a liquid flowing in a narrow pipe using XFEM

GUT Fahrenheit Courtyard + Campus Dinner Tent

14:00 – 15:00 LUNCH

Auditorium Novum

15:00 – 15:50 GENERAL LECTURE

Kienzler R., Schneider P.
Consistent plate theories - a matter still not settled?

15:50 – 16:00 BREAK

16:00 – 17:30 PARALLEL SESSIONS

**Auditorium Novum MS10: Mechanics in Engineering Problems
Session 7**

Chair: Gilewski W.

- 16:00 – 16:15 Nepelski K., Błazik-Borowa E., Lipecki T., Bęc J.
Verification of the building FEM model on the basis of natural vibration measurements
- 16:15 – 16:30 Żak A., Krawczuk M., Waszkowiak W.
Dynamic behaviour of a Timoshenko periodic beam
- 16:30 – 16:45 Szmit Z., Warmiński J., Latański J.
Dynamics of rotating pendulums attached to a hub driven by a non-ideal energy source
- 16:45 – 17:00 Maciejewski I., Krzyżyński T.
Modelling of the vibration reduction system used for protection of working machine operators
- 17:00 – 17:15 Chalecki M., Jemielita G.
Free vibrations and buckling stability of micro-nonhomogeneous plate band resting on an elastic subsoil

**GUT Aula MS24: Thin-Walled Structures
Session 5: Beams**

Chair: Kotelko M.

- 16:00 – 16:15 Lewandowski R., Baum M.
Free vibrations of multi-layered beams with fractional-derivative viscoelastic layers

- 16:15 – 16:30 Magnucka-Blandzi E., Walczak Z.
Buckling and vibrations of seven-layer beams with lengthwise corrugated main core
- 16:30 – 16:45 Kołakowski Z., Kowal-Michalska K., Mania R.
Global and local elastic-plastic stability of FML columns of open and closed cross-section
- 16:45 – 17:00 Wittenbeck L., Jasion P.
Buckling and vibrations of seven-layer beam with lengthwise corrugated main core – numerical study
- 17:00 – 17:15 Floricel A., Zagari G., Benzar S., Ungureanu V.
Numerical analysis of thin-walled cold-formed steel column-base over-roofing solutions

GUT Room 300 **MS23: Theoretical, Computational and Experimental Mechanics for Coupled Field Problems and Multiphase Materials**
Session 1

Chair: Hartmann S.

Keynote Speech

- 16:00 – 16:25 Malinowska A.B.
Generalized fractional calculus of variations and its applications
- 16:25 – 16:40 Błaszczak T.
Derivation and numerical solution of fractional Euler-Bernoulli beam equation
- 16:40 – 16:55 Liebold C.
Determination of elastic material parameters in higher-order continua based on size-dependent bending behavior of epoxy and SU-8
- 16:55 – 17:10 Sharma K.
Volume fraction and finite-specimen size effects on a limited-permeable inclined crack in 2D magnetoelastic media using distributed dislocation method
- 17:10 – 17:25 Sumelka W.
Anisotropic fractional non-local model

GUT Room 200 **MS10: Mechanics in Engineering Problems**
Session 8

Chair: Ziemiański L.

- 16:00 – 16:15 Sławiński D., Badur J.
A concept of elastic-plastic material adaptation by the thermal-FSI simulation
- 16:15 – 16:30 Ryzińska G., Skrzat A.
Modeling of aluminum extrusion process based on Bodner-Partom model
- 16:30 – 16:45 Banaszekiewicz M.
The creep behaviour of high-temperature rotating components with power-law constitutive models
- 16:45 – 17:00 Żerdzicki K., Kłosowski P., Woźnica K.
Modelling of the viscoelastic properties of the technical fabric VALMEX
- 17:00 – 17:15 Mucha W.
Real-time hybrid simulation using materials testing machine and Finite Element Method

17:15 – 17:30 Wiśniewska M.
Consistency and reliability of the surface texture measurement results obtained with different measuring methods

**GUT Room 211 MS18: Porous Materials - Theory, Numerical Simulations and Experiments
Session 1**

Chair: Kubik J.

- 16:00 – 16:25 **Keynote Speech**
Cieszko M.
Macroscopic description of capillary transport of liquid and gas in unsaturated porous materials
- 16:25 – 16:40 Chuda-Kowalska M., Malendowski M.
Sensitivity analysis of behaviour of sandwich plate with PU foam core with respect to boundary conditions and material model
- 16:40 – 16:55 Cieszko M., Bednarek T., Czerwiński T.
Stationary flow of non-wetting liquid through layer of unsaturated porous material
- 16:55 – 17:10 Cyganik Ł., Binkowski M., Kokot G., Rusin T., Popik P., Bolechała F., Nowak R., Wróbel Z., John A.
Experimental verification of the relationships between Young's modulus and bone density using Digital Image Correlation

**GUT Room 213 MS20: Safety and Reliability of Structures
Session 2**

Chair: Glema A.

- 16:00 – 16:15 Przybyłowicz P.M.
Effect of non-linear elastic support of a rotating flexible shaft on bifurcating behaviour of the system
- 16:15 – 16:30 Sybilski K., Małachowski J., Płatek P., Baranowski P.
Assessment of the biomechanical parameters of the disabled drivers during frontal crash
- 16:30 – 16:45 Knitter-Piątkowska A., Guminiak M.
Application of the Discrete Wavelet Transform to defect localization in plates
- 16:45 – 17:00 Lewandowski R., Przychodzki M., Pawlak Z.
Numerical analysis of the influence of temperature on the dynamic characteristics of structures with viscoelastic dampers
- 17:00 – 17:15 Kula K., Socha T.
Rheology of wooden beams reinforced by CFRP with discontinuities
- 17:15 – 17:30 Błażejowski P., Kucharczyk A., Korentz J.
Buckling curve for reinforcing steel bars

**GUT Room 462 MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization
Session 3: Biomechanics, Part 1**

Chair: Żochowski A.

- 16:00 – 16:15 Kim D., Segev R.
Notes on the mechanics of the octopus's arm
- 16:15 – 16:30 Pakuła M.
Identification of mechanisms of attenuation and dispersion of ultrasonic waves in cancellous bone – theory and experiment

- 16:30 – 16:45 Stachowiak E., Pilecki Z., Balin A.
Analysis of the impact of selected anthropometric parameters on the kinematics of the patellofemoral joint
- 16:45 – 17:00 Szepietowska K., Lubowiecka I., Magnain B., Florentin E.
Stochastic approach in the modelling of implants used in hernia repair in the context of uncertainties of abdominal wall properties
- 17:00 – 17:15 Tomaszewska A., Lubowiecka I., Szymczak C.
Influence of the stiffening effect on mesh fixation in ventral hernia repair
- 17:15 – 17:30 Wykupil M., John A.
Strength analysis of sportsmen knee joint

**GUT Room 167 MS01. Adaptive Methods and Error Estimation
Session 1**

Chair: Rachowicz W., Zboński G.

- Keynote Speech**
- 16:00 – 16:25 Cecot W., Oleksy M., Krówczyński M.
Study of convergence of the multigrid homogenization
- 16:25 – 16:40 Abramowicz M.
The application of model parameter estimation method to detect connection damage in a steel-concrete beam using modal force residuals
- 16:40 – 16:55 Klimczak M., Cecot W.
Integration of hp-adaptive FEM and local numerical homogenization
- 16:55 – 17:10 Kucwaj J.
The influence of different equivalent boundary conditions on approximate solution to a potential problem
- 17:10 – 17:25 Miazio Ł., Zboński G.
Stress convergence in adaptive resolution of boundary layers in the case of 3D-based first- and higher-order shell models

17:30 – 17:50 COFFEE BREAK

17:50 – 19:20 PARALLEL SESSIONS

**Auditorium Novum MS10: Mechanics in Engineering Problems
Session 9**

Chair: Badur J.

- 17:50 – 18:05 Djoković J.M., Nikolić R.R., Bujnak J.
Influence of the weld geometry on the Stress Intensity Factor (SIF) of the cylindrical welded joint subjected to complex load
- 18:05 – 18:20 Glushkov E., Glushkova N., Eremin A., Lammering R.
Investigation of resonance diffraction by hidden obstacles using laminate element method
- 18:20 – 18:35 Guminiak M., Pawlak Z.
An application of the Boundary Element Method to the analysis of initial stability of plates
- 18:35 – 18:50 Bogusławski A., Tyliszczak A., Wawrzak K.
Absolutely unstable round hot jet – a numerical study

- 18:50 – 19:05 Garbachevsky V., Veremeichik A., Khvisevitch V., Rakhuba V.
Axisymmetric problem of non-uniform thermoelasticity
- 19:05 – 19:20 Rzydzik S.
Data preprocessing for diagnostic intuitionistic statement network

GUT Aula **MS24: Thin-Walled Structures**
Session 6: Structural analysis

Chair: Magnucki K.

- 17:50 – 18:05 Ostrowski P., Michalak B.
Tolerance modelling of stability of thin plates with a dense system of ribs
- 18:05 – 18:20 Jędrysiak J.
Tolerance modelling of dynamics of microstructured functionally graded plates
- 18:20 – 18:35 Bodaszewski W., Markiewicz I.
New structures shaped with the SADSf method and their properties in elastic state
- 18:35 – 18:50 Tomczyk B.
A new tolerance model of dynamic problems for thin bi-periodic cylindrical shells
- 18:50 – 19:05 Lewiński P.M., Rak M.
Soil-structure interaction of cylindrical water tanks with linearly varying wall thickness
- 19:05 – 19:20 Gawryluk J., Teter A.
Numerical modal analysis of three-blade helicopter rotor model elaborated with the FEM

GUT Room 300 **MS23: Theoretical, Computational and Experimental Mechanics**
for Coupled Field Problems and Multiphase Materials
Session 2

Chair: Leszczyński J.

Keynote Speech

- 17:50 – 18:15 Hartmann S., Rothe S., Grafenhorst M., Erbs P., Düster A.
Theory and numerics of monolithic and partitioned thermo-mechanical coupling
- 18:15 – 18:30 Pamin J., Wcisło B.
Influence of heat conduction on instabilities in large strain thermoplasticity
- 18:30 – 18:45 Butzke J.E., Bargmann S.
High-temperature deformation of polysynthetically twinned crystals of TiAl – numerical modeling of yield point
- 18:45 – 19:00 Morozov I.A., Komar L.A.
Hyperelastic structural-mechanical model of filled rubber
- 19:00 – 19:15 Stręk T., Jopek H.
Topology optimization of a two-phase core of a sandwich panel

GUT Room 200 **MS10: Mechanics in Engineering Problems**
Session 10

Chair: Konderla P.

- 17:50 – 18:05 Maślak M., Pazdanowski M., Snela M.
Numerically based quantification of internal forces generated in steel sway frame structures with flexible end-plate joints, exposed to fire

- 18:05 – 18:20 Mazurkiewicz Ł., Małachowski J., Baranowski P., Damaziak K., Pytel W., Mertuszka P.
Numerical modelling of detonation in mining face cut-holes
- 18:20 – 18:35 Garstecki A., Rzeszut K., Polus Ł., Klój M., Terech M.
The impact of fire situation on the static and stability response of the bearing steel structure
- 18:35 – 18:50 Wekezer J.W., Gleba M., Siervogel J.
Development of a crashworthiness standard for assessment of cutaway buses
- 18:50 – 19:05 Jarzębowska E., Szewczyk A.
Design of a switching tracking controller for a manipulator after its actuator failure
- 19:05 – 19:20 Wojnicz W., Lipiński K.
A redundantly actuated 4RRR planar parallel manipulator and sensitivity of its trajectory inexactness to inertia parameters of its limb

**GUT Room 211 MS18: Porous Materials - Theory, Numerical Simulations and Experiments
Session 2**

Chair: Cieszko M.

- 17:50 – 18:05 Pakuła M., Drelich R., Kaczmarek M., Kubik J.
Studies of ultrasonic waves in water or air saturated high porosity materials
- 18:05 – 18:20 Cieszko M., Szczepański Z., Kempieński M., Gadzała P., Burzyński M.
Application of Micro Computed Tomography and Mercury Porosimetry to determination of internal structure of aerated concrete
- 18:20 – 18:35 Studziński R., Pozorski Z., Chuda-Kowalska M.
Experimental and numerical analysis of sandwich panels with composite core
- 18:35 – 18:50 Wegner T., Kurpisz D.
The energy criteria of plastic flow for aluminum foam in complex load state

**GUT Room 462 MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization
Session 4: Biomechanics, Part 2**

Chair: Gambin B.

- 17:50 – 18:05 Gaweł D., Główska P., Nowak M.
Digitally reconstructed radiograph procedure for modifying 3D model to meet the intraoperative vertebrae location
- 18:05 – 18:20 Ardatov O., Maknickas A., Alekna V., Kacianauskas R.
Finite element stress analysis of lumbar vertebrae body during osteoporotic degradation
- 18:20 – 18:35 Argatov I., Mishuris G.
Impact-induced fissuring of articular cartilage: an asymptotic modelling study
- 18:35 – 18:50 Mochnacki B., Majchrzak E.
Numerical modeling of biological tissue freezing process using the dual-phase-lag equation
- 18:50 – 19:05 Nowak J., Kaczmarek M.
Simulation of indentation test for lymphedematous tissue within poroelastic model
- 19:05 – 19:20 Tesch K., Kaczorowska K.
On various modelling approaches to real-time visualisation of blood flow

GUT Room 167 **MS01. Adaptive Methods and Error Estimation**
Session 2

Chair: Cecot W., Zboiński G.

- 17:50 – 18:05 Ostapov O., Vovk O., Shynkarenko H.
Computable double-sided a posteriori error estimates for h-adaptive Finite Element Method
- 18:05 – 18:20 Ptaszny J.
A fast multipole Boundary Element Method in the analysis of 3D linear elastic structures
- 18:20 – 18:35 Rachowicz W., Zdunek A., Cecot W.
An adaptive Finite Element Method for contact problems in finite elasticity
- 18:35 – 18:50 Stelmashchuk V., Shynkarenko H.
Numerical modeling of thermopiezoelectricity steady state forced vibrations problem using adaptive Finite Element Method
- 18:50 – 19:05 Zboiński G.
Application of the element residual methods to dielectric and piezoelectric problems

19:20 – 19:30 BREAK

GUT Senate Room

19:30 –20:00 PCM–CMM PERMANENT COMMITTEE ASSEMBLY

FRIDAY, SEPTEMBER 11th

Auditorium Novum

8:30 – 9:20 GENERAL LECTURE

Rachowicz W.

Finite Element Method simulations of linear and non-linear elasticity problems with error control and mesh adaptation

9:20 – 9:30 BREAK

Auditorium Novum

9:30 – 10:20 GENERAL LECTURE

Kuczma M.

Shape memory materials and structures: modelling and computational challenges

10:20 – 10:40 COFFEE BREAK

10:40 – 12:10 PARALLEL SESSIONS

Auditorium Novum MS10: Mechanics in Engineering Problems Session 11

Chair: Błazik-Borowa E.

- 10:40 – 10:55 Hashemiyani Z., Packo P., Staszewski W.J., Uhl T.
Rescaling procedure in the Local Interaction Simulation Approach for shear wave propagation modelling in magnetic resonance elastography
- 10:55 – 11:10 Jasiewicz M., Powalka B.
Receptance coupling for turning with a follower rest
- 11:10 – 11:25 Felisiak P., Sibilski K., Wróblewski W.
Nonlinear model of spacecraft relative motion in an elliptical orbit
- 11:25 – 11:40 Chiliński B., Pakowski R.
Analysis of bending and torsional vibrations of rotors with using perturbation methods
- 11:40 – 11:55 Lünemann B., Wings E., Chlebus E.
Calibration of a parallel kinematic machine tool utilizing a MEMS inertial measurement unit
- 11:55 – 12:10 Fityka A., Ryfa A., Walencki Ł., Buliński Z., Adamczyk W.
Numerical and experimental study of the car aerodynamics

GUT Aula MS24: Thin-Walled Structures Session 7: Varia

Chair: Tylikowski A.

- 10:40 – 10:55 Shahravi S., Rezvani M.J., Jahan A.
Optimization of foam-filled grooved circular tubes for energy absorption using response surface method
- 10:55 – 11:10 Yukhymets P., Shekero A., Zecheru G., Dumitrescu A.
Strength of a damaged T-joint under Low-Cycle Loading
- 11:10 – 11:25 Kędzia P., Kosma Z.
Bending of thin rectangular polyethylene plate with ferrofluid in inhomogeneous magnetic field
- 11:25 – 11:40 Bochkarev S.A., Lekomtsev S.V., Matveenko V.P.
Hydroelastic stability of thin-walled structures interacting with liquids

GUT Room 300 **MS23: Theoretical, Computational and Experimental Mechanics for Coupled Field Problems and Multiphase Materials**
Session 3

Chair: Sumelka W.

Keynote Speech

- 10:40 – 11:05 Pęcherski R.B., Nowak M., Fraś L.
Numerical simulations of auxetic metallic foam fabrication process
- 11:05 – 11:20 Maruszewski B.T., Gajewski T., Grabski J.K., Sumelka W., Szajek K., Walczak T.
Simulation of extrusion processes in porous media
- 11:20 – 11:35 Nowak Z., Nowak M., Pęcherski R.B., Potoczek M., Śliwa R.E.
Numerical simulations of mechanical properties of alumina foams based on computer tomography
- 11:35 – 11:50 Kołodziej J.A., Mierzwiński M., Grabski J.K.
Computer simulation of the effective viscosity in Brinkman's filtration equation using the Trefftz method

GUT Room 462 **MS08: Mathematical Methods in Solid Mechanics, Biomechanics and Optimization**
Session 5: Homogenization and continuum modelling

Chair: Lewiński T.

- 10:40 – 10:55 Wojnar R., Gambin B.
Thermal properties of biomaterials on the example of the liver
- 10:55 – 11:10 Bar O.
Fast algorithm for flux around closely spaced non-overlapping disks
- 11:10 – 11:25 Mityushev V., Nawalaniec W.
Basic sums in description of random structures
- 11:25 – 11:40 Czapla R.
Simulations of random geometric objects on the plane and their applications
- 11:40 – 11:55 Wojnar R.
Modelling polycrystalline structure of collagen fibrils dense packing by the most uniform concentric pattern
- 11:55 – 12:10 Bielski W., Wojnar R.
Laminar flow past the bottom with obstacles – from suspension to porous medium

12:10 – 12:30 COFFEE BREAK

Auditorium Novum

12:30 – 13:20 GENERAL LECTURE

Kowalewski Z.L.

*Experimental attempts for creep and fatigue damage analysis of materials
- state of the art and new challenges*

13:20 – 13:30 BREAK

Auditorium Novum

13:30 – 14:00 PCM-CMM-2015 CLOSING CEREMONY

GUT Fahrenheit Courtyard + Campus Dinner Tent

14:00 – 15:00 LUNCH

GUT Senate Room

15:00 – 15:30 PCM-CMM SCIENTIFIC COMMITTEE ASSEMBLY

15:30 – 17:00 Participants' transfer to Gdańsk Old Town
(no buses for the Participants will be provided)

17:00 – 19:00 GUIDED EXCURSION TO GDAŃSK OLD TOWN

SATURDAY, SEPTEMBER 12th

9:00 – 14:00 GUIDED EXCURSION TO TEUTONIC ORDER CASTLE IN MALBORK
(buses for the Participants will be provided in front of the "Gdańsk Główny" Railway Station, starting from 9:00)

