



# World Symposium on Mechanical - Materials Engineering & Science

9-11 September, 2021 – Prague (Czech Republic)



## WMMES 2021

**World Symposium on  
Mechanical - Materials Engineering & Science**  
9-11 September 2021 – Prague (Czech Republic)

### REGISTRATION

**(from 8 September 2021 – Wednesday to 9 September 2021 - Thursday)**

8 September, 2021  
9 September, 2021

Registration will start on Wednesday from 10:30 to 20:00  
from 08:30 until 10 September 2021

### OPENING / CEREMONY

**8 September 2021 – Thursday (in Hall PRAGUE)**

10:30 - 11:00  
11:00 - 12:00

Opening Concert  
Opening Speeches

*Will be announced in venue because of the pandemic*



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## ORAL PROGRAM 9 September, 2021 – Thursday

<b>HALL - PRAGUE EAST</b>		<b>9 September, 2021 – Afternoon Sessions</b>
<b>SESSION: Mechanical Engineering, Industrial Design and Manufacturing - I</b>		
Chairman: Bernhard Heiden - Carinthia University of Applied Sciences, Austria Marian Marschalko – Ostrava Technical University, Czech Republic		
13:00 - 13:15	INCREASING THE RELIABILITY OF FMEA EVALUATION BY MODIFYING RATING SCALES AND APPLYING PAIRWISE COMPARISON METHOD Speaker: Edina Kulcsár - University of Pannonia, Hungary	
13:15 - 13:30	INFLUENCE OF OPERATING PARAMETERS ON THE PERFORMANCE OF A SOLAR ADSORPTION REFRIGERATION MACHINE Speaker: Adenane Ghrici - University of Tlemcen, Algeria	
13:30 - 13:45	EVALUATING COORDINATED COOPERATIVE CONTROL OF THREE ACTIVE CAR SYSTEMS USING FUZZY-LOGIC Speaker: Vase Jordanoska - University "Ss. Cyril and Methodius", Republic of Macedonia	
13:45 - 14:00	THE INFLUENCE OF THE IMPACT ON THE DYNAMIC RESPONSE OF THE DRIVE MECHANISM OF AN INTERNAL COMBUSTION ENGINE Speaker: Andra Constantin - University of Craiova, Romania	
14:00 - 14:15	DESIGN AND NUMERICAL CHARACTERIZATION OF A HUMAN ANKLE PROSTHESIS Speaker: Copilusi Cristian - University of Craiova, Romania	
14:15 - 14:30	EXPERIMENTAL APPROACHES REGARDING A CHILDREN WALKING REHABILITATION TEST BED Speaker: Copilusi Cristian - University of Craiova, Romania	
14:30 - 15:00	<b>Coffee Break</b>	
<b>SESSION: Mechanical Engineering, Industrial Design and Manufacturing - II</b>		
Chairman: Copilusi Cristian - University of Craiova, Romania		
15:00 - 15:15	FACTORS AFFECTING THE IMPLEMENTATION OF INFORMATION SYSTEMS IN MANUFACTURING INDUSTRY Speaker: Paraskevi Kapetanopoulou - Aristotle University of Thessaloniki, Greece	
15:15 - 15:30	IMPROVEMENT OF LOW TEMPERATURE IMPACT TOUGHNESS THROUGH FLUX MODIFICATION FOR SUBMERGED ARC WELDED LOW CARBON STEEL E350 PLATES Speaker: Lucky Saklani - SLIET Longowal, India	
15:30 - 15:45	ATTRIBUTES RELEVANT FOR SUSTAINABLE ADDITIVE MANUFACTURING - MATERIAL DRIVEN APPROACH Speaker: Daniela Mladenovska - Mother Teresa University, Republic of Macedonia	



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15:45 - 16:00	WHEELCHAIR CLIMBING CONSTRUCTION FOR INDUSTRIAL LOGISTICAL APPLICATIONS Speaker: Bernhard Heiden - Carinthia University of Applied Sciences, Austria
16:00 - 16:15	THE INCORPORATION AND USE OF METAMATERIALS IN EVERYDAY OBJECTS Speaker: Delia Alexandra Prisecaru - University Politehnic of Bucharest, Romania
16:15 - 16:30	LOOSE MATERIAL FILLING IN THE LOADING TROUGH PROFILE OF THE BELT CONVEYOR Speaker: Leopold Hrabovský - VSB Technical University of Ostrava, Czech Republic
16:30 - 16:45	MECHANICAL FRICTION RETAINERS USED FOR BRAKING AND LOCKING PALLETS IN PLACE Speaker: Leopold Hrabovský - VSB - Technical University of Ostrava, Czech Republic
16:45 - 17:00	VERSATILE HARDWARE TO ANALYZE THE PERFORMANCE OF A NONLINEAR CONTROLLER Speaker: Deyka Garcia - Universidad Tecnológica de Panamá, República de Panamá
17:00 - 17:15	PROCESS OF ADDITIVELY MANUFACTURING AN INDEXABLE INSERT Speaker: Jindřich Sýkora - University of West Bohemia, Czech Republic
17:15 - 17:30	INVESTIGATION OF THE INFLUENCE OF THE AIRFLOW AROUND A GRINDING WHEEL ON THE COOLANT SUPPLY Speaker: Roman Stabauer - University of Applied Sciences RFH- Cologne, Germany
<b>END OF ORAL SESSIONS</b>	



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## SESSION: Computational Mechanical - Materials Engineering & Science - I

Chairman: Marian Drusa – Zilina University, Slovakia

13:00 - 13:15	A NEW NUMERICAL FRAMEWORK FOR THE FULL FIELD MODELLING OF DYNAMIC RECRYSTALLIZATION IN CPFEM CONTEXT APPLIED TO MODEL 304L STEEL Speaker: David Alejandro Ruiz Sarrazola - MINES ParisTech, PSL – Research University, France
13:15 - 13:30	DYNAMIC ANALYSIS OF A TANK VEHICLE TRANSPORTING FLAMMABLE LIQUIDS Speaker: Clio Vossou - National Technical University, Greece
13:30 - 13:45	EXPERIMENTAL CALIBRATION METHODOLOGY FOR NUMERICAL PARAMETERS IN A DEM SOFTWARE BASED IN GRANULAR MATERIAL STATIC TESTS Speaker: Rodrigo Estay Huidobro - Federico Santa Maria Technical University, Chile
13:45 - 14:00	DYNAMIC SIMULATION ANALYSIS OF A MOTORCYCLE SUSPENSION SYSTEM – ASSESSMENT OF COMFORT Speaker: Stefan Segla - Technical University of Kosice, Slovakia
14:00 - 14:15	MODELING OF THIN SHEET FORMING PROCESSES BY COMBINING SOLID-SHELL FINITE ELEMENT WITH NON-QUADRATIC ANISOTROPIC PLASTICITY MODELS APPLICATION TO MAGNETIC PULSE FORMING PROCESSES Speaker: Mohamed Mahmoud - PSL - Research University, Computational Solid Mechanics Research Group, France
14:15 - 14:30	PRODUCTION AND CHARACTERIZATION OF ANIMAL WASTE REINFORCED COMPOSITE MATERIALS BY POWDER METALLURGY Speaker: Ahmet Yonetken - Afyon Kocatepe University, Turkey
14:30 - 15:00	<b>Coffee Break</b>

## SESSION: Computational Mechanical - Materials Engineering & Science - II

Chairman: István Gábor Gyurika - University of Pannonia, Hungary

15:00 - 15:15	IN-PLANE-STRESS PREDICTION BASED ON A NEURAL NETWORK WITH RVE SIMULATIONS Speaker: Shuang Zhou - RWTH Aachen University, Germany
15:15 - 15:30	ADVANCED CALCULATION OF THE DEFLECTION OF WORM SHAFTS WITH FEM Speaker: Johannes Gründer - Technische Hochschule Nürnberg Georg Simon Ohm, Germany
15:30 - 15:45	VALIDATION OF THE TIME DOMAIN BOUNDARY ELEMENT METHOD IN ACOUSTICS REGARDING FLEXIBLE MULTIBODY SIMULATIONS AND ACOUSTIC MEASUREMENTS Speaker: Schneider Simon - University of Applied Sciences of Ulm, Germany



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15:45 - 16:00	INFLUENCE OF RADIATION DAMAGE ON THE FRACTURE TOUGHNESS OF ALUMINUM ALLOYS – COMPUTATIONAL METHODS ON THE AA6061-T6 Speaker: Mohamed Shokeir - Université Paris Salay, France
16:00 - 16:15	QUANTITATIVE PHASE-FIELD MODELING OF CRACK PROPAGATION IN MULTI-PHASE BRITTLE MATERIALS Speaker: Arezoo Emdadi - Missouri University of Science and Technology, USA
16:15 - 16:30	NUMERICAL CHARACTERISTICS OF PLASMA ARC WELDING IN SiC-ZrB <sub>2</sub> CERAMICS USING A MULTI-SCALE/MULTI-PHYSICS PHASE-FIELD MODEL Speaker: Arezoo Emdadi - Missouri University of Science and Technology, USA
16:30 - 16:45	CHALLENGES IN DEVELOPING OF 3D NONLINEAR VISCOELASTIC MODELS Speaker: Liva Pupure - Riga Technical University, Latvia
<b>SESSION: Materials Science and Engineering - I</b>	
Chairman: Luís Mesquita - Instituto Politécnico de Bragança, Portugal	
16:45 - 17:00	BEHAVIOUR OF CELLULAR BEAMS AT ELEVATED TEMPERATURES Speaker: Luís Mesquita - Instituto Politécnico de Bragança, Portugal
17:00 - 17:15	DETERMINATION OF RESEARCH GUIDELINES AND ESTABLISHING OF A TEST FRAMEWORK FOR THE DEVELOPMENT OF NEW CVD COATING FORMULATIONS AND NEW APPROACH COATING EQUIPMENT Speaker: István Gábor Gyurika - University of Pannonia, Hungary
17:15 - 17:30	FIRE PERFORMANCE OF WOOD AND WOOD-BASED PANELS TOWARDS THE DEVELOPMENT OF WOOD FIRE DOORS Speaker: Luís Mesquita - Instituto Politécnico de Bragança, Portugal
17:30 - 17:45	WEAR BEHAVIOUR OF AUSTEMPERED, DUCTILE IRON MICROALLOYED WITH BORON UNDER DIFFERENT CONTACT LOAD BY DRY SLIDING WEAR CONDITIONS Speaker: Mikheil Chikhradze - F. Tavadze Metallurgy and Materials Science Institute, Georgia
<b>END OF ORAL SESSIONS</b>	



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## 10 September, 2021 – Friday

<b>SESSION: Mechanical Engineering, Industrial Design and Manufacturing - III</b> Chairmen: Kazimierz Drozd - Lublin University of Technology, Lublin, Poland Petr Král - Czech Academy of Sciences, Czech Republic	
08:45 - 09:00	ESTIMATION OF DYSPEPTIC MECHANICAL ENERGY IN POLYLACTIDE SAMPLES MADE BY 3D PRINTING BY INCREASING DEGREE OF FILLING Speaker: Anna Gawel - Cracow University of Technology, Poland
09:00 - 09:15	ON THE APPROPRIATE PREPARATION AND REALIZATION OF PRODUCTION PROCESS QUALITY ATTRIBUTE MEASUREMENT Speaker: Eliška Cézová - Czech Technical University in Prague, Czech Republic
09:15 - 09:30	WATER HAMMER EXPERIMENTAL AND NUMERICAL INVESTIGATION IN LABORATORY PIPELINE APPARATUS Speaker: Viktor Iliev - Ss. Cyril and Methodius" University in Skopje, R. North Macedonia
09:30 - 09:45	DISCRETE ELEMENT SIMULATION OF DRY SNOW USING THE DEVELOPED ANALYTIC BOND MODEL Speaker: Hassan Bahaloo - Lula University of Technology, Sweden
09:45 - 10:00	KINEMATIC ANALYSIS OF A HYPER-REDUNDANT ROBOT WITH APPLICATION IN VERTICAL FARMING Speaker: Ciprian Rad - Technical University of Cluj-Napoca
10:00 - 10:15	TENSILE STRENGTH AND DIMENSIONAL VARIANCES IN PARTS MANUFACTURED BY SLA 3D PRINTING Speaker: Ognen Tuteski - Ss Cyril and Methodius University, Republic of North Macedonia
10:15 - 10:30	ANALYSIS OF LONGITUDINAL BEAM DAMAGE OF CONTAINER CHASSIS SEMI-TRAILER USING FINITE ELEMENT METHOD – CASE STUDY Speaker: Kazimierz Drozd - Lublin University of Technology, Lublin, Poland
10:30 - 11:00	<b>Coffee Break</b>
<b>SESSION: SS- Mechanical Properties in Progressive Mechanically Processed Metallic Materials</b> <b>Convener:</b> Assoc.Prof.Dr. Radim Kocich - VŠBU Technical University of Ostrava, Czech Republic <b>Chairmen:</b> Assoc.Prof.Dr. Radim Kocich - VŠBU Technical University of Ostrava, Czech Republic	
11:00 - 11:15	STRESS-STRAIN DISTRIBUTION WITHIN ROTARY SWAGED TUNGSTEN HEAVY ALLOY Speaker: Ludmila Krátká - VŠB-Technical University of Ostrava, Czech Republic
11:15 - 11:30	RESIDUAL STRESS DISTRIBUTION IN COPPER-ALUMINIUM CLAD COMPOSITE FABRICATED BY ROTARY SWAGING Speaker: Pavel Strunz - Nuclear Physics Institute, Czech Republic



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11:30 - 11:45	EFFECT OF RESIDUAL STRESS ON CRACKING OF HOT DIE-FORGED BRASS FITTINGS Speaker: Lenka Kuncicka - VSB-Technical University of Ostrava, Czech Republic
11:45 - 12:00	CORRELATION OF TEXTURE AND RESIDUAL STRESS IN TWIST CHANNEL ANGULAR PRESSED LAMINATED AL/CU COMPOSITES Speaker: Radim Kocich - VSB-Technical University of Ostrava, Czech Republic
12:00 - 12:15	INFLUENCE OF ROTARY SWAGING ON CREEP BEHAVIOUR OF P92 STEEL Speaker: Petr Král - Czech Academy of Sciences, Czech Republic
<b>LUNCH BREAK</b>	

## **SESSION: Energy**

Chairman: Nihad Dukhan - University of Detroit Mercy, USA

13:00 - 13:15	EXPERIMENTAL ANALYSIS OF PIEZO-ELECTRIC ENERGY HARVESTING TILES Speaker: Anthony Ademola Adeyanju - University of West Indies, Trinidad and Tobago
13:15 - 13:30	DEFINING PONDER INDICATORS FOR ACHIEVING ENERGY EFFICIENCY OF A PUMP STATION WITH CASCADE PUMP ARRANGEMENT Speaker: Marija Lazarevikj - "Ss.Cyril and Methodius" University in Skopje, R. North Macedonia
13:30 - 13:45	DETERMINATION OF THE AERODYNAMIC FORCES ACTING ON A SINGLE AIRFOIL BASED ON EXPERIMENTAL MEASUREMENTS Speaker: Marija Lazarevikj - "Ss.Cyril and Methodius" University in Skopje, R. North Macedonia
13:45 - 14:00	AN APPROACH TOWARDS GUIDE VANES OPTIMIZATION FOR VARIABLE SPEED FRANCIS TURBINES Speaker: Filip Stojkovski - Ss. Cyril and Methodius" University in Skopje, Republic of North Macedonia
14:00 - 14:15	IMPROVEMENT OF EXTRAPOLATED HUB-HEIGHT WIND DATA USING CONTINUOUS WAVE LIDAR MEASUREMENT Speaker: Maduako Emmanuel Okorie - Namibia University of Science and Technology (NUST), Namibia
14:15 - 14:30	A COOLING DEIGN FOR AN END CELL IN FUEL-CELL STACK USING FORCED AIR FLOW IN METAL FOAM: MODELING AND EXPERIMENT Speaker: Nihad Dukhan - University of Detroit Mercy, USA
14:30 - 15:00	<b>Coffee Break</b>



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<b>SESSION: Materials Science and Engineering - II</b>	
Chairman: Dietrich Voswinkel - Paderborn University, Germany Franco Concli - Free University of Bolzano, Italy	
15:00 - 15:15	MOLECULAR DYNAMICS INVESTIGATION ON THE EFFECT OF MWCNTS ON THERMO-MECHANICAL PROPERTIES OF AMORPHOUS CELLULOSE REINFORCED WITH SILICON CARBIDE NANOTUBES (Video Presentation) Speaker: Ahmad Y. Al-Maharma - RWTH Aachen University, Germany
15:15 - 15:30	IMPROVING THE ACCURACY OF DEEP-DRAWN FIBER-METAL LAMINATE PARTS BY PRELIMINARY SURFACE TREATMENT Speaker: Dietrich Voswinkel - Paderborn University, Germany
15:30 - 15:45	17-4 PH SS MANUFACTURED VIA SELECTIVE LASER MELTING: LOW-CYCLE-FATIGUE PROPERTIES Speaker: Franco Concli - Free University of Bolzano, Italy
15:45 - 16:00	17-4 PH SS MANUFACTURED VIA SELECTIVE LASER MELTING: HIGH CYCLE FATIGUE PROPERTIES Speaker: Franco Concli - Free University of Bolzano, Italy
16:00 - 16:15	FEM MODELING OF TOOL WEAR IN HARD TURNING OPERATIONS Speaker: Franco Concli - Free University of Bolzano, Italy
16:15 - 16:30	DEVELOPMENT OF THERMOMECHANICAL PROCESSING OF FULLY FERRITIC LAVES PHASE STRENGTHENED STAINLESS STEELS Speaker: Jana Pöpperlová - RWTH Aachen University, Germany
16:30 - 16:45	A COMPARISON BETWEEN THEORETICAL AND EXPERIMENTAL DATA OF THERMO-PHYSICAL PROPERTIES OF JATROPHA OIL AND IRON NANOPARTICLES Speaker: Veikko Shalimba - Namibia University of Science and Technology, Namibia
16:45 - 17:00	MECHANICAL BEHAVIOUR OF 4D PRINTED COMPONENTS FABRICATED BY BINDER JET ADDITIVE MANUFACTURING FROM SHAPE MEMORY ALLOY POWDERS Speaker: Constantin V Solomon - Youngstown State University, USA
17:00 - 17:15	EFFECT OF NOBLE METAL (M=Ag, Au) DOPING CONCENTRATION ON MECHANICAL AND BIOMEDICAL PROPERTIES OF Ti-M MATRIX THIN FILMS DEPOSITED BY MAGNETRON SPUTTERING Speaker: Cecil Cherian Lukose - Northumbria University, UK
17:15 - 17:30	EFFECT OF CORUNDUM SAND PROPORTION ON STRENGTH PROPERTIES GEOPOLYMER MORTAR BASED ON FLY ASH (2) Speaker: Kinga Plawecka, Kinga Korniejenko, Patrycja Bazan - Cracow University of Technology, Poland
17:30 - 17:45	EXPERIMENTAL INVESTIGATION OF FAST SINTERING OF SMALL ICE PARTICLES Speaker: Hassan Bahaloo - Lulea University of Technology, Sweden
<b>END OF ORAL SESSIONS</b>	





## POSTER PROGRAM 9 September, 2021 – Thursday

**13.00 -15.30**

Stand No: 1 VARIANCES OF THE THERMO-MECHANICAL PROPERTIES OF FILLED POLYMER MATERIALS IN A VARIATION OF INJECTION MOLDING INPUT PARAMETERS

Václav Čontoš - WITTE Nejdek s.r.o., Czech Republic

Stand No: 2 FEA ANALYSIS OF TENSILE STRESS THIN STEEL SHEET WITH REINFORCING RIBS CREATED BY LOCAL LASER TREATMENT

Oleksandr Kapustynskyi - Vilnius Gediminas Technical University, Lithuania

Stand No: 3 FABRICATION, MICROSTRUCTURE, AND WEAR DAMAGE OF THE Si<sub>3</sub>N<sub>4</sub>-Ag-GNPs COMPOSITES PREPARED BY SPS

Pavol Hvizdoš - Slovak Academy of Sciences, Slovakia

Stand No: 4 UNSTEADY HEAT CONDUCTIVITY PROBLEM FOR COATED CYLINDER UNDER MIXED BOUNDARY HEATING CONDITION

Shor Turchyn - Kazimierz Wielki University, Poland

Stand No: 5 INNOVATIVE SOLUTION FOR THE TRANSPORT OF WIRE ROPES OF LARGE SIZE AND LENGTH

Luigi Solazzi - Università degli studi di Brescia, Italy

Stand No: 6 A METHOD TO OPTIMISE SEMI-TRAILERS WITH THE USE OF FEM ANALYSIS AND DURABILITY TESTS WITH A ROAD SIMULATOR

Marcin Januszka - Silesian University of Technology, Poland

Stand No: 7 APPLYING SCHEME OF THE EXPONENTIAL REPLACEMENT IN THE FINITE ELEMENT METHOD FOR THE PROBLEM OF ADVECTION-DIFFUSION

Yuliya Turchyn - Ivan Franko National University of Lviv, Ukraine

Stand No: 8 DESIGN AND MANUFACTURING METHOD OF GFRP BLADES FOR VERTICAL AXIS WIND TURBINE

Marin Guțu - Technical University of Moldova, Republic of Moldova

Stand No: 9 HEAT TRANSFER IN DOUBLE ANNULAR DUE TO NATURAL CONVECTION

Jan Pařez - Czech Technical University in Prague, Czech Republic

Stand No: 10 FINITE/BOUNDARY ELEMENT METHOD SIMULATION FOR HEPATIC TUMOR ABLATION USING INTERSTITIAL HYPERTHERMIA

Marek Paruch - Silesian University of Technology, Poland



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Stand No: 11 POLYPROPYLENE AND STEEL FIBER REINFORCEMENT EFFECT ON GEOPOLYMER COMPOSITE LONG-TERM PROPERTIES

Rihards Gaillitis - Riga Technical University, Riga, Latvia, Latvia

Stand No: 12 ELEMENTS OF TECHNOLOGICAL EDUCATION - CLASSIFICATION OF TECHNOLOGICAL PRODUCTION PROCESSES IN THE MATERIALS INDUSTRY

Daniela Alice Luta - University Polyethnic of Bucharest, Romania

Stand No: 13 ELEMENTS OF TECHNOLOGICAL EDUCATION - CLASSIFICATION OF PRODUCTION ENTERPRISES IN THE MATERIALS INDUSTRY

Daniela Alice Luta - University Polyethnic of Bucharest, Romania

Stand No: 14 WEIGHT OPTIMIZATION BY USING BOTH ALUMINUM AND COMPOSITE MATERIAL ON THE BIG EXCAVATOR

Andrea Buffoli - University of Brescia, Italy

Stand No: 15 PROCESS OF DRYING PEACHES BY FORCED CONVECTION

Visanu Vitali - Technical University of Moldova, Republic of Moldova Technical University of Moldova, Republic of Moldova

Stand No: 16 TRIBO-MECHANICAL BEHAVIOR OF GEOPOLYMER COMPOSITES REINFORCED WITH WASTED FLAX FIBER

Patrycja Bazan - Cracow University of Technology, Poland

Stand No: 17 INTERFACE CHARACTERIZATION OF Al/SiCp COMPACTS

Mariana Ciurdas - University Polyethnic of Bucharest, Romania

Stand No: 18 CORROSION BEHAVIOR AND STRUCTURAL CHARACTERIZATION OF TITANIUM DENTAL IMPLANT

Daniela Alina Neculescu - University Polyethnic of Bucharest, Romania

Stand No: 19 ANALYTICAL MODEL OF THE FRICTIONAL HEATING IN A DISC-PAD SYSTEM WITH FUNCTIONALLY GRADED MATERIALS DURING BRAKING

Katarzyna Topczewska - Bialystok University of Technology, Poland

Stand No: 20 KINEMATIC ANALYSIS OF A HYPER-REDUNDANT ROBOT WITH APPLICATION IN VERTICAL FARMING

Ciprian Lapusan - Technical University of Cluj-Napoca, Romania



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### SOCIAL PROGRAM

#### **9 September, 2021 – Thursday**

Opening Concert in Hall Prague - 10.30  
Welcome Cocktail in Garden of Duo Hotel - 19:00

#### **11 September, 2021 – Saturday**

Gala Dinner in Garden of Duo Hotel - 19:00  
(Barbeque Party and Surprise Shows)

#### **NOTES**

*Cocktail and gala dinner will be organized in open air.*

*As it was announced on the official web page, this year for the safety of our participants, Cultural & Field Trip will unfortunately not be able to be organized because of the travel restrictions by bus due to the Covid-19 pandemic.*