



ICCS27

27th International Conference on Composite Structures

School of Engineering and Architecture
Ravenna Campus of University of Bologna, Italy
3-6 September 2024

Conference program

Nicholas Fantuzzi

Michele Bacciocchi

António J.M. Ferreira

General information

Conference chairs

Nicholas Fantuzzi, University of Bologna, Italy

Michele Bacciocchi, University of San Marino, San Marino

Honorary chair

António J.M. Ferreira, University of Porto, Portugal

Local organizing committee

Imene Abidi, Sapienza University of Rome, Italy

Saaranya Kumar Dasari, Sapienza University of Rome, Italy

Antoine Dib, University of Bologna, Italy

Zhongwei Hu, Southeast University, China

Razie Izadi, Sapienza University of Rome, Italy

Saeedeh Qaderi, University of Bologna, Italy

Abdolmajid Rezaei, Sapienza University of Rome, Italy

Aurora Ronconi, University of Modena and Reggio Emilia, Italy

Luca Soldati, University of San Marino, San Marino

Vinicius de Barros Souza, University of São Paulo, Brazil

Dimitra Tsimpli, Pegaso Telematic University, Italy

Meral Tuna, University of Bologna, Italy

Yingrui Ye, Xi'an Jiaotong University, China

Shengwang Zhang, Beijing University of Technology, China

Conference venue

School of Engineering and Architecture

Via Tombesi dall'Ova 55, 48121 Ravenna, Italy

Ravenna Campus, University of Bologna, Italy

Zoom links

Room DANTE (mixed: physical and virtual)

[Access the virtual Room DANTE](#)

Room TEODORICO (mixed: physical and virtual)

[Access the virtual Room TEODORICO](#)

Room GIUSTINIANO (mixed: physical and virtual)

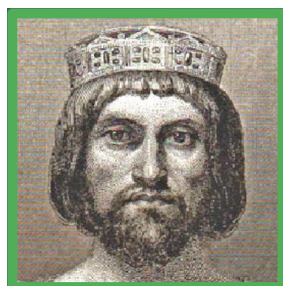
[Access the virtual Room GIUSTINIANO](#)

Room GALLA PLACIDIA (mixed: physical and virtual)

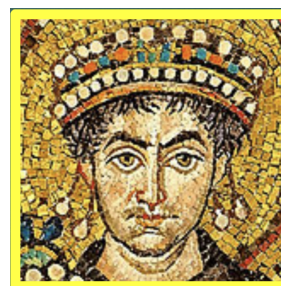
[Access the virtual Room GALLA PLACIDIA](#)



(a) DANTE



(b) TEODORICO



(c) GIUSTINIANO



(d) GALLA PLACIDIA

Figure 1: Identification of the conference rooms.

Conference program – *Italy time (CEST)*

Monday, September 2nd

15h00-17h00 — Pre-registration

Tuesday, September 3rd

08h00 — Registration opens

10h20-10h40 — Opening (*Conference chairs*)

10h40-11h20 — Commemorative welcome keynote lecture (*T. Sadowski*)

11h30-12h10 — Mid-morning keynote lecture (*P. Trovalusci*)

12h10-13h30 — Mid-morning parallel sessions

13h30-14h30 — Lunch break

14h30-15h10 — Afternoon keynote lecture (*Northern Light Composites*)

15h10-17h30 — Afternoon parallel sessions

Wednesday, September 4th

08h00 — Registration opens

09h00-09h40 — Early-morning keynote lecture (*G. Milani*)

09h40-11h00 — Early-morning parallel sessions

11h00-11h30 — Break

11h30-12h10 — Mid-morning keynote lecture (*S.H. Chang*)

12h10-13h30 — Mid-morning parallel sessions

13h30-14h30 — Lunch break

14h30-15h10 — Afternoon keynote lecture (*H. Hu*)

15h10-17h10 — Afternoon parallel sessions

Thursday, September 5th

08h00 — Registration opens

09h00-09h40 — Early-morning keynote lecture (*V. Eremeyev*)

09h40-11h00 — Early-morning parallel sessions

11h00-11h30 — Break

11h30-12h10 — Mid-morning keynote lecture (*Visa Cash App RB Formula 1 Team*)

12h10-13h30 — Mid-morning parallel sessions

13h30-14h30 — Lunch break

14h30-17h10 — Afternoon parallel sessions

19h30 — Social Dinner - On Reservation

Friday, September 6th

08h00 — Registration opens

09h00-11h00 — Early-morning parallel sessions

11h00-11h30 — Break

11h30-13h30 — Mid-morning parallel sessions

13h30-14h30 — Lunch break

14h30-17h10 — Afternoon parallel sessions

Live program

Tuesday, September 3 (Mid-morning)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: Patrizia Trovalusci

10h20

Opening

Conference Chairs

Commemorative Welcome Keynote Lecture

10h40

1014 | Data-based micromechanical modelling of the dynamic response of interpenetrated composites

Sadowski, Tomasz; Postek, Eligiusz; Pietras, Daniel; Guhathakurta, Jaj nabalkya; Kruszka, Leopold; Grązka, Michał

Keynote Lecture

11h30

1399 | Multiscale non-local (size-dependent) continuum descriptions of materials with periodic and random microstructure

Trovalusci, Patrizia

PRIN 2022: New Insights in the Mechanical Modeling of Cultural Heritage for Sustainable Restoration: Green Composites and Nano-Technologies (GreNaTe) (chaired by N. Fantuzzi, D. Baraldi, P. Trovalusci, M. Tuna)

12h10

1287 | In-plane behaviour of NFRCM-strengthened masonry modelled by means of discrete elements

Baraldi, Daniele; Boscato, Giosuè; Cecchi, Antonella; Thatikonda, Nandini Priya

12h30

1397 | Clay composite as a construction material through additive manufacturing process

Abidi, Imene; Carboni, Biagio; Gaff, Milan; Fantuzzi, Nicholas; Trovalusci, Patrizia

12h50

—online—

1363 | On the mechanical description of composite materials as micropolar continua

Colatosti, Marco; Trovalusci, Patrizia; Fantuzzi, Nicholas; Carboni, Biagio

13h10

1414 | On static fracture analysis of brittle micropolar plates

Tuna, Meral; Fantuzzi, Nicholas; Trovalusci, Patrizia

— Break —

Tuesday, September 3 (Mid-morning)

Room TEODORICO

Session chair: Olivier Polit

Session chair: Jakub Szabelski

Composite structures and materials

12h10

1231 | Comparison of effect of glassy carbon admixtures on mechanical properties of selected bone cements.

Szabelski, Jakub; Karpinski, Robert; Krakowski, Przemysław; Jonak, Jozef

12h30

1278 | The influence of controlled delamination areas upon mechanical properties in sandwich composites

Janiszewski, Jacek; Komorek, Andrzej; Bieńczak, Rafał; Bakula, Mieczysław; Zioto Mirosław

12h50

1284 | Overlap and gap analysis and optimisation in Automated Tape Laying via adaptive finite elements

Moruzzi, Martino Carlo; Bagassi, Sara; Cinefra, Maria

13h10

—online—

1102 | The Effects of Pore Morphology on Mechanical Response and Hot-Spot Formation in Pre-billets of HMX-Based PBXs under Press Loading Process

Zhang, Wei; Liu, Rui; Chen, Pengwan

— Break —

Tuesday, September 3 (Mid-morning)

Room GIUSTINIANO

Session chair: Antonio Ferreira

Session chair: Angelika Arkuszyńska

Joints

12h10

1111 | The Synergy of Mechanical Surface Treatment and -Zirconium Phosphate Nanosheets on Interface Strength in Metallic-Polyurethane Adhesive Joints

Bakhbergen, Umut; Kalimuldina, Gulnur; Sherif, Araby

12h30

—online—

1246 | Experimental investigation on the effect of forced assembly on fatigue behavior of single-lap, countersunk composite bolted joints

Qu, Hao; Li, Dongsheng; Zhai, Yunong; Ge, Ende; Xi, Wei; Ji, Chenhao

12h50

1189 | Influence of bearing stresses caused by mechanical fasteners on the joints strength of quasi-isotropic composites

Arkuszyńska, Angelika; Rośkiewicz, Marek; Godzimirski, Jan

13h10

1255 | Pathways to optimize mechanical properties of C/SiC bolts: preform design and process optimization

Ma, Xuehan; Zhang, Yi

— Break —

Tuesday, September 3 (Mid-morning)

Room GALLA PLACIDIA

Session chair: Ricardo De Medeiros

Session chair: Ana Neves

Health monitoring and inspection techniques for composite structures

12h10

1133 | Analyzing the influence of delamination on composite structures using modal analysis and statistical indices

Zanetti, Matteo; Negri, Douglas; Vandepitte, Dirk; Tita, Volnei; De Medeiros, Ricardo

12h30

1150 | Residual strength prediction of composites after fatigue loading

Ebrahimi, Ali; Shadmehri, Farjad; Hoa, Suong van

12h50

1219 | Multifunctional nanocomposite assessment using carbon nanotube fiber sensors

Butt, Hassaan A.; Krasnikov, Dmitry V.; Kondrashov, Vladislav A.; Shandakov, Sergey D.; Wang, Zeyu; Korsunsky, Alexander M.; Sergeichev, Ivan V.; Nasibulin, Albert G.

13h10

—online—

1097 | Investigation of damage detection efficiency of PZT sensors based on full guided wavefield measurements of glass-fiber reinforced epoxy laminates

Dziendzikowski, Michal; Tao, Nan; Kowalczyk, Kamil; Kozera, Paulina; Dydek, Kamil; Dragan, Krzysztof; Groves, Roger M.

— Break —

Tuesday, September 3 (Afternoon)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: Qun Huang

Keynote Lecture

14h30

1401 | Advancing Sustainable Composite Materials with Recyclable Thermoplastic Resin and Low-Impact Raw Materials

Stagni, Alessandro; Bignolini, Fabio

Micro- and nano-mechanics

15h10

1211 | Pyroelectric effect in nano sized piezoelectric structures

Repka, Miroslav; Sator, Ladislav

15h30

1387 | Exploring Void Defects in LATP Manufacturing through 3D Microscale Modelling

Ferreira, Gregorio; Tobin, Emma; Bandaru, Aswani; Weaver, Paul M.

Stability of nano, micro and macro composite structures

15h50

1144 | A finite element formulation for buckling analysis of composite laminated thin-walled beam-type structures considering shear deformation effects

Banić, Damjan; Turkalj, Goran; Lanc, Domagoj

16h10

1169 | Exploring the relationship between buckling and delamination in composites with different ply thicknesses

Anilkumar, P. M.; Venkat, S. S.; Tariq, M.; Scheffler, S.; Rolfes, R.

16h30

1268 | Stability Analysis of Multilayer Shells with Eigenstrain Mismatch using CUF Method

Zhang, Zaoxu; Wang, Changguo

Advanced numerical techniques for composite structures and materials

16h50

1241 | Multiscale analysis of in-plane periodic thin composite beams

He, Tianyun; Huang, Qun; Damil, Noureddine; Hu, Heng

Multi-scale analysis of composites

17h10

1332 | Development of Ultrasound Inversion Methods for Characterising Features in 3D Woven Composite Materials

Rostand, Tayong Boumda

— End of the day —

Tuesday, September 3 (Afternoon)

Room TEODORICO

Session chair: Seong Su Kim

Session chair: Ana Neves

Composite structures and materials

15h10

1053 | Predicting the Structural Behavior of Type IV Composite Pressure Vessels through Ring Burst Testing

Kim, Wonki; Hong, Hyunsoo; Sim, Gyumin; Kim, Seong Su

15h30

—online—

1250 | Improvement of the mechanical properties of Kagome structures using PUR foam matrices: static and dynamic investigations

Cosa, Alexandru Viorel; Geller, Sirko; Faust, Johann; Protz, Richard; Modler, Niels; Serban, Dan-Andrei

15h50

1084 | Polyvinylidene fluoride-co-trifluoroethylene/graphene oxide (PVDF-HFP/GO) composite as separator for high-performance lithium-oxygen battery

Yen, Chien-Sheng; Zhong, Bing-Han; Wang, Teng-Te; Lue, Shinhjiang Jessie

16h10

—online—

1366 | Comparison of the fire properties of more sustainable resin systems in sandwich and non-sandwich composite structures

Ares-Elejoste, Patricia; Ballester, Jesus; Creonti, Gianluigi; Mingazzini, Claudio

16h30

1198 | Tensile and flexural elastic properties of woven fabric composite laminate with a small number of plies

Yoshida, Keishiro; Miyakawa, Ryo; Okuyama, Shinto

16h50

—online—

1195 | Single-lap Shear Testing of Additively Manufactured Sandwich Composite Inserts

Severson, Patrick; Lutz, Anna; El Hajjar, Rani

Functionally graded and porous materials and structures

17h10

1075 | Influence of processing parameters on aluminum foam produced using TiH₂ as a foaming agent.

Derbala, Imad; Tria, Djalel Eddine

— End of the day —

Tuesday, September 3 (Afternoon)

Room GIUSTINIANO

Session chair: *Luís D.C. Ramalho*

Session chair: *Zhang Yi*

Joints

15h10

1204 | Fast Computation of Stress Concentrations in the Bondline of Stepped Lap Joints

Nzeke Zedom, Arold; Linke, Markus; Rachmat, Muhammad Abid; García-Manrique, Juan Antonio

15h30

—online—

1349 | Multi-Failure Coupling Mechanism of Hybrid Steel/GFRP Adhesive Joints

Xing, Liu

15h50

1244 | Elastic-plastic semi-analytical method and optimization for curved scarf bonding repairs of composite structures

Bin, Liu; Liu, Yancheng

16h10

1256 | Review of preparation processes and joining property of ceramic matrix composite fasteners

Zhang, Yi

16h30

1389 | The Application Research of DIC Technology in the Rehabilitation Evaluation of Knee Joint Movement Deformation

Ma, Kun ; Zhang, Xinyu; Wu, Jiaquan; Ye, Fei; Li, Zhangchun

16h50

1167 | Strength prediction of a composite adhesive single lap joint under impact using the ISSF criterion

Ramalho, Luís D.C.; Gonçalves, Diogo C.

— End of the day —

Tuesday, September 3 (Afternoon)

Room GALLA PLACIDIA

Session chair: Ricardo De Medeiros

Session chair: Marco Gigliotti

Health monitoring and inspection techniques for composite structures

15h10

1248 | Mechanism failure analysis of unidirectional hybrid pultruded rebars under static and fatigue loading condition using acoustic emission

Zielonka, Pawel; Lesiuk, Grzegorz; Smolnicki, Michal; Duda, Szymon; Stabla, Pawel

15h30

1346 | Machine Learning-based Defect Detection for a Closed-Loop Quality Assurance System in the Automated Tape Laying Process

Mimra, Christopher; Barnard, Amanda; Fox, Bronwyn; Radjef, Racim; Middendorf, Peter

15h50

1358 | Flexural performance of concrete beam under electrochemical chloride extraction against corrosive conditions

Ann, Ki Yong; Park, Kwang-pil; Jeon, Hye-Kyoung; Jang, Sung-Hwan; Jung, Ho Seop; Hwang, Woongik

16h10

1385 | Development of a Carbon Nanotube Sensor Using 3D Photocuring Printing for Strain Monitoring of CFRP Structures

Song, Yiheng; Liu, Yuzhi; Okabe, Yoji

16h30

1117 | Nonlinear Analysis of Wave-Propagation Through a Delaminated Composite Strip Using the Variational Asymptotic Method

Gajbhaye, Param; Prakasha, Punith; Mitra, Mira; Guruprasad, P.J.; Yelve, Nitesh

16h50

1035 | Advancing Structural Health Monitoring in Adhesively Bonded Repairs: A Novel In-Situ Acoustic Emission-Based Methodology

Saeed Abdulqader Al-Nadhari, Abdulrahman; Ceren, Yildirim; Topal, Serra; Yildiz, Mehmet

— End of the day —

Wednesday, September 4 (Early-morning)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: Christian Mittelstedt

Keynote Lecture

09h00

1158 | Efficient numerical strategies to predict the structural behavior of FRCM reinforced masonry

Milani, Gabriele

Beam, Plate and Shell Theories

09h40

1059 | Some aspects of unsymmetric laminated composite plate – Second bifurcation

Bohlooly Fotovat, Mehdi; Kubiak, Tomasz

10h00

1085 | Flexural-Torsional Buckling of Composite Beams using Generalized Beam Theory (GBT) and Ritz Method

Kharghani, Navid; Mittelstedt, Christian

10h20

1101 | A semi-analytical solution for critical buckling loads of stiffened orthotropic circular cylindrical shells

Yuan, Ye; Xing, Yufeng

10h40

—online—

1342 | A comprehensive analysis of laminated composite, sandwich and bio-inspired helicoidal composite curved beams: Part 1- bending

Pham, Sang; Karamanli, Armagan; Lee, Seunghye; Vo, Thuc P.

— Break —

Wednesday, September 4 (Early-morning)

Room TEODORICO

Session chair: Ana Neves

Session chair: Jin Zhou

Additive manufacturing

09h40

1061 | Scaling effects in the mechanical response of 3D printed continuous fiber reinforced corrugated sandwiches

Zhou, Jin; Liu, Xin; Liu, Hui; Liu, Chunqi

10h00

1079 | Microstructure Prediction in Laser Additive Manufacturing Using Machine Learning and Cellular Automata Approaches

Ji, Yuxiang; Han, Jimbang; Liu, Zhao; Yue, Zhongjie; Moy, Charles K.S.; Wang, Xianhui; Gao, Yang; Song, Hanlin; Han, Weijian

10h20

1091 | Modeling of local meso-scale interactions in metal-composite joints based on 3D anchors matrix

Altunok, Fikret Enes; Quarta, Francesco; De Pasquale, Giorgio

10h40

—online—

1294 | Maximizing Sustainability: Enhancing GF-ABS Mold Recycling for Large Format Additive Manufacturing

Bas-Bolufer, Javier; Castelló-Pedrero, Pablo; García Gascón, Cesar; García-Manrique, Juan Antonio

— Break —

Wednesday, September 4 (Early-morning)

Room GIUSTINIANO

Session chair: Luigi Solazzi

Session chair: Jun Woo Lim

Composites in innovative applications (chaired by L. Solazzi)

09h40

1152 | Effect of selected ceramic admixtures on mechanical properties of acrylate bone cements

Karpiński, Robert; Szabelski, Jakub; Falkowicz, Katarzyna; Krakowski, Przemysław

10h00

1168 | Feasibility study of a front underrun protection device using different materials for industrial vehicles

Solazzi, Luigi; Mingotti, Giorgio; Tomasi, Ivan

10h20

1212 | Development of high performance carbon felt composite electrode for vanadium redox flow battery

Kaur, Amanpreet; Lim, Jun Woo

10h40

1213 | SnO₂ nanoparticles embedded SPEEK membrane for vanadium redox flow battery

Kaur, Amanpreet; Lim, Jun Woo

— Break —

Wednesday, September 4 (Early-morning)

Room GALLA PLACIDIA

Session chair: Marco Gigliotti

Session chair: Andrii Kondratiev

Design and applications of composites

09h40

1216 | Evaluation of the effectiveness of the repair of metal semi-monocoque structures using composite materials and adhesives

Barca, Iga; Roškowicz, Marek; Godzimirski, Jan

10h00

—online—

1228 | Surface-oriented CNTs-PVA composite Electric Double Layer ionogel flexible pressure sensor for wearable applications

Ma, ChengDong; Liu, WangYu

10h20

1220 | Weight optimization of design parameters of composite structures

Kondratiev, Andrii

10h40

—online—

1392 | Seismic behavior of RC columns jacketed by textile-reinforced ultrahigh toughness cementitious composite: Experiments and simulations

Hou, Lijun; Sun, Wei; Liu, Gengsheng; Xia, Fuzheng; Pan, Zicheng

— Break —

Wednesday, September 4 (Mid-morning)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: J.L. Mantari

Keynote Lecture

11h30

1115 | Application of bone healing simulation technique to the design of orthoses/prostheses made of flexible fibrous composites

Chang, Seung-Hwan

Beam, Plate and Shell Theories

12h10

1113 | Analysis of magneto-electro-elastic FGM plates by the Moving Finite Element Method

Sator, Ladislav; Repka, Miroslav

12h30

1270 | Distributions of transverse normal and shear stresses on laminated plates and shells by a positional FEM formulation

De Barros Souza, Vinícius; Fantuzzi, Nicholas; Coda, Humberto Breves

12h50

1320 | A unique HSDT theory for porous materials powered by machine learning

Mantari, J.L.; Yarasca, Jorge

13h10

1373 | Shell and Solid-Shell Finite Elements for Forming Simulations of Thick CFRP Stacks at the Macroscale

Cotrim, Bruno; Polit, Olivier; D'Ottavio, Michele; Vidal, Philippe; Valot, Emmanuel

— Break —

Wednesday, September 4 (Mid-morning)

Room TEODORICO

Session chair: Christian Mittelstedt

Session chair: Yogesh Gandhi

Additive manufacturing

12h10

1096 | Experimental and numerical investigation of additively manufactured continuous carbon fiber-reinforced composite structures

Babbi, Giulia; Gandhi, Yogesh; Minak, Giangiacomo; Pavlovic, Ana

12h30

1122 | Optimization of Layer Adhesion in Large Format Additive Manufacturing with Glass Fiber reinforced ABS

Castelló-Pedrero, Pablo; García-Gascón, César; Bas-Bolufer, Javier; García-Manrique, Juan Antonio

12h50

1126 | The use of lattice structures as sandwich cores: approaches to modelling and design

Georges, Hussam; Becker, Wilfried; Mittelstedt, Christian

13h10

1285 | Additive manufacturing method for manufacturing composite structures with embedded fibre Bragg grating sensors

Mieloszyk, Magdalena; Rimašauskienė, Rūta; Orłowska, Anita

— Break —

Wednesday, September 4 (Mid-morning)

Room GIUSTINIANO

Session chair: Luigi Solazzi

Session chair: Jun Woo Lim

Composites in innovative applications (chaired by L. Solazzi)

12h10

1214 | Development of high-performance MXene-rGO carbon felt composite electrodes for vanadium redox flow batteries

Singh, Gurpreet; Lim, Jun Woo

12h30

—online—

1298 | Analysis of thermal development during curing and mechanical characterization of nanomodified adhesives based on in-mould induction heating system

Sánchez López, Fernando; Cano, Laida; Sakalyte, Asta; Domenech, Luis; Garcia, Victor; Ibañez, Manuel

12h50

1409 | Comparative Analysis of Carbon Fiber Recycling Technologies: Advantages of CURTI's Thermal Recycling Technology in Europe's First Plant by HERA

Cantelli, Mirco

Composite structures in civil engineering

13h10

1311 | Experimental and numerical analysis of shear connection in composite cold-formed steel beam system for modular building application

Baharom, Shahrizan; S M Priok, Rashid; Zulkifli, Muhammad Khairuddin; Kaish, A.B.M. Amrul

— Break —

Wednesday, September 4 (Mid-morning)

Room GALLA PLACIDIA

Session chair: Marina L. Moretti

Session chair: Joao Reis

Design and applications of composites

12h10

1326 | Automatic assembly of tensegrity chain structures based on NURBS curves

Dong, Yongcan; Yuan, Xingfei

12h30

1394 | Design model for FRP-confined circular and rectangular reinforced concrete columns

Moretti, Marina L.

12h50

1407 | Alternative methods for the qualification of composite repair system used in the oil industry

Reis, Joao; da Costa Mattos, Heraldo

13h10

—online—

1149 | Transfer learning-based crashworthiness prediction for the composite structure of a subway vehicle

Yang, Chengxing; Meng, Kangpei; Yang, Liting; Guo, Weinian; Xu, Ping; Zhou, Shengtong

— Break —

Wednesday, September 4 (Afternoon)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: Seong Su Kim

Keynote Lecture

14h30

1400 | Quantum Computing Enhanced Data-Driven Computational Mechanics for Composite Structures

Hu, Heng

Optimization techniques and methods

15h10

1031 | Innovative Predictive Modeling and Optimization of Composite Material Properties Using Machine Learning and Genetic Algorithms

Beji, Hamdi; Messenger, Tanguy; Kanit, Toufik

15h30

—online—

1350 | Parallel Constrained Bayesian Optimization Algorithm for Optimizing VRB/OW-GFRP Structures

Xu, Zheng; Duan, Libin

15h50

1063 | Optimal local reinforcement designs for maximum strength of laminated composite plates with a cutout

Kaya, Sinan; Sonmez, Fazil O.

16h10

1066 | Optimizing Filament Winding Processes for Fiber-Reinforced Composites: A Multi-Scale Numerical Analysis Approach

Bae, Sangyoon; Lee, Hugon; Sarfraz, Muhammad Salman; Pakartiwan, Kiyaranu Putra; Jo, Jaeyoung; Kim, Seong Su

16h30

1119 | Topology optimization of metamaterials for improved shear modulus

Saurabh, Shubham; Gupta, Abhinav; Chowdhury, Rajib

16h50

1288 | Topology optimization of multi material structures using physics informed neural networks

Singh, Ajendra; Chowdhury, Rajib

— End of the day —

Wednesday, September 4 (Afternoon)

Room TEODORICO

Session chair: Eligiusz Postek

Session chair: Atas Akin

Additive manufacturing

15h10

1415 | Environmental cryogenic cyclic aging of additively manufactured carbon-fiber reinforced polycarbonate

Agostino, Pietro; Yousuf, Md Ibna; Grammatikos, Sotirios

15h30

1235 | Hybrid manufacturing and mechanical performance of single and interpenetrating phase metallic metamaterials

Singh, Agyapal; Karathanasopoulos, Nikolaos

15h50

1239 | Impact and compression after impact (CAI) characteristics of continuous fibre reinforced 3D-printed composite laminates

Atas, Akin; Zehni, Ozan Can; Xu, Jiaqi; Lowe, Tristan

16h10

—online—

1251 | Additive Manufacturing of Bolted CFRP Composite Joints with Tailored Fibre Steering

Yang, Dongmin; Li, Aonan; Zhang, Haoqi

16h30

1273 | The interface role in Al₂O₃/AlSi₁₂ composite

Postek, Eligiusz; Sadowski, Tomasz; Tahani, M; Guhathakurta, Jaj nabalkya

16h50

—online—

1372 | Mesoscale analysis and RVE random generation of shot-earth mixtures

Cluni, Federico; Gusella, Vittorio; Schiantella, Mattia

— End of the day —

Wednesday, September 4 (Afternoon)

Room GIUSTINIANO

Session chair: Marco Gigliotti

Session chair: Paweł Stabla

Delamination, damage, fracture, failure and durability of composites

15h10

1378 | Low, medium, and high-velocity impact and residual tensile strength of aerospace-grade carbon fiber composite laminate

Iqbal, Nabeel; Mendizábal, Virginia; Borja, Martínez; Bernat-Maso, Ernest; Pérez, Marco A.; Pitta, Siddharth; Rojas, Jose I.

15h30

—online—

1123 | Fatigue behavior of cracked steel beams reinforced with CFRP plates using a toughened adhesive

Colombi, Pierluigi; Calabrese, Angelo Savio; D'Antino, Tommaso; Bocciarelli, Massimiliano

15h50

—online—

1262 | Axial compression of composite filament-wound tubes: mechanical analysis with acoustic emission technique considering the influence of mosaic pattern

Stabla, Paweł; Smolnicki, Michał; Duda, Szymon; Zielonka, Paweł; Błazejewski, Wojciech; Barcikowski, Michał; Paczkowska, Karolina

16h10

1297 | MODE I FRACTURE TOUGHNESS EVALUATION OF INTERPLY CARBON/EPOXY - GLASS/EPOXY HYBRID COMPOSITES

Karatas Demircan, Cansu; Coker, Demirkan

16h30

1155 | Numerical Simulations of Embedded Delamination Defects on Damage Mechanisms in Tapered Composite Laminates

Jin, Lu; Chen, Yong; Wang, Zijian; Zhang, Yukun; Tian Jie

Probabilistic models for composites

16h50

1327 | A probabilistic constant life diagram based on a weakest link approach with application to composite fan blades

Tang, Xu; Chen, Yong; Jin, Lu

— End of the day —

Wednesday, September 4 (Afternoon)

Room GALLA PLACIDIA

Session chair: Seung-Hwan Chang

Session chair: Marek Roskowicz

Design and applications of composites

15h10

1071 | Addressing Structural Certification Challenges with FEM Analysis in Electric Seaplane Wing Preliminary Design

Tapullima, Jonathan; Kleemann, Nils; Haugen, Bjørn

15h30

1107 | Effect of modulus changes of a biodegradable bone plate on early bone healing of tibial fractures

Che, Jia-le; Chang, Seung-Hwan

15h50

1114 | Experimental study on mechanical performance degradation of a hybrid bone plate under simulated human body environment

Lee, Ho-Seok; Chang, Seung-Hwan

16h10

1210 | Evaluating the effectiveness of repairing metal semi monocoque structures using composite materials and adhesive - shear-loaded plates

Barca, Iga; Roskowicz, Marek; Godzimirski, Jan

16h30

—online—

1143 | Performance of 3D printed Small UAV Propellers Made of a Carbon Fiber-reinforced Thermoplastic

Mendez, Joshua; Shaw, Surupa; Diaz Rodriguez, Ivan De Jesus; Guo, Guodong

Analysis of sandwich, adaptive, morphing and variable stiffness composites

16h50

1043 | Thermal Buckling Analysis of Variable Stiffness Laminated Composite Beam using Semi-Analytical Approach

Satyajeet Dash; Tanish Dey

— End of the day —

Thursday, September 5 (Early-morning)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: Simonetta Boria

Keynote Lecture

09h00

1137 | Waves in solids with surface stresses

Eremeyev, Victor

70th Birthday Prof. Sadowski (invited talks only)

09h40

1171 | Experimental study on the electrical conductivity and strain sensitivity of fibre-reinforced thermoplastic for structural health monitoring

Ciardello, Raffaele; Ciampaglia, Alberto; Roccia, Salvatore

10h00

1182 | Experimental and Numerical Investigation on Low Velocity Impact of Carbon, Flax and Hybrid Composites

Del Bianco, Giulia; Giammaria, Valentina; Capretti, Monica; Boria, Simonetta; Lenci, Stefano; Ciardello, Raffaele; Castorani, Vincenzo

10h20

1321 | Modal characteristics of functionally graded porous Timoshenko beams with variable cross-sections

Burlayenko, Vyacheslav; Altenbach, Holm; Dimitrova, Svitlana

10h40

—online—

1125 | Global stability of hybrid FGM-FML and laminated columns with a rectangular cross section

Teter, Andrzej; Kolakowski, Zbigniew

— Break —

Thursday, September 5 (Early-morning)

Room TEODORICO

Session chair: Heng Hu

Session chair: Ana Neves

Graphene-based composites

09h40

1056 | Elastodynamics of graphene with nonlinear second strain gradient effects

Yang, Bo; Fantuzzi, Nicholas; Bacciocchi, Michele; Fabbrocino, Francesco; Mousavi, Mahmoud

10h00

1181 | Development of Highly Conductive Untwisted CNT Yarn by -bridging and Analytical Evaluation of Electrical Properties using First Principles Calculation.

Miura, Tempu; Kobori, Hiromu; Shimizu, Toshiaki; Hosoi, Atsushi; Kawada, Hiroyuki

10h20

1316 | Exfoliation and self-healing agent functionalization of graphene for tailoring healing behavior in CFRP laminated composites

Khan, Nazrul Islam; Halder, Sudipta

10h40

1328 | Use of Carbon- and Graphene-Nanomaterials for Multi-Functional Polymer-Nano-Composites

Trabzon, Levent; Navidfar, Amir; Hejazi, Anas

— Break —

Thursday, September 5 (Early-morning)

Room GIUSTINIANO

Session chair: Sung Joon Kim

Session chair: Piotr Arkuszyński

Impact problems

09h40

1020 | Landing simulation of vertical take-off aircraft using spring mass model

Kim, Sung Joon

10h00

1139 | The use of a different top layer to increase the puncture resistance of a carbon fibre-reinforced polymer

Komorek, Andrzej; Przybyłek, Paweł; Szczepaniak, Robert; Podskarbi, Jagoda; Komorek, Łukasz

10h20

1190 | Influence of preloading on damage in CFRP composite material subjected to low-energy impact loads

Arkuszyński, Piotr; Rośkowicz, Marek

10h40

—online—

1047 | IMPACT BIRD STRIKE SIMULATION ON A COMPOSITE LEADING EDGE

Russo, Mario; Baroni, Antonio; Corvaglia, Stefano

— Break —

Thursday, September 5 (Early-morning)

Room GALLA PLACIDIA

Session chair: Mantas Atutis

Session chair: Robert Karpinski

FRP reinforced structures

09h40

1108 | Effect of Fiber Orientation in Chopped Prepregs on Stabilization of In-Plane Tensile Properties in Discontinuous Carbon Fiber Composites

Matsukura, Izumi; Murata, Sho; Kobiki, Akira

10h00

1315 | The Reinforcement of Glulam Beam-to-Column Joints using FRP

Simsek Turker, Yasemin; Kilincarslan, Semsettin; Avcar, Mehmet; Terzi, Serdal

10h20

1333 | Detection of Porosity across CFRP Layers using Machine Learning Techniques Applied to Theoretical and Experimental Ultrasound Data

Vasilache, Mihai-Mircea; Tretiak, Iryna; Velisavljevic, Vladan; Tayong Boumda, Rostand

10h40

1382 | A nonlocal damage-plasticity constitutive model for concrete in compression

Peng, Zhe-Qi; Zheng, Bo-Tong; Teng, Jin-Guang

— Break —

Thursday, September 5 (Mid-morning)

Room DANTE

Session chair: Nicholas Fantuzzi

Session chair: Claudio Mingazzini

Keynote Lecture

11h30

1402 | Composite Structure quick repair in motorsport

Marino, Gianclaudio; Petrella, Stefano

Sustainable, recyclable and recycled composite materials (chaired by C. Mingazzini)

12h10

1045 | Unlocking Potential: Exploring the Use of Waste Mixed Plastics and Waste Fibres in High-Performance C-Sections

Stankovic, Danijela; Davidson, James R.; Bulstrode, Saskia; Fernando, Dilum; Ray, Dipa

12h30

1087 | Specification Desideratum to Form and Use Industrial Waste-Based Composites to Practice, Sustainable Building Performances in the View of Analytical Hierarchy Process

Kabuarachchi, Dulana Gajaba; Attanayaka, Vajira

12h50

1162 | Influence of process parameters on quality of aluminum High Pressure Die Casting (HPDC) parts manufactured with a novel vertical chambered machine

Muschalski, Lars; Seurich, Paul; Kuhtz, Moritz; Mrotzek, Tino; Gude, Maik

13h10

1313 | Investigation of Physical-Mechanical Characteristics of Granulated Artificial Aggregates Synthesized from Wood Ash Using Green Technology

Vidikas, Vitoldas; Augonis, Algirdas

— Break —

Thursday, September 5 (Mid-morning)

Room TEODORICO

Session chair: Victor Eremeyev

Session chair: Ana Neves

Composite structures and materials

12h10

1354 | Investigations on the bond-critical failure of the CFRP-ECC-NC composite interfaces: Experimental study and analytical model

Wu, Fangwen; Cao, Jincheng; Zhao, Bitong; Ma, Yateng

12h30

1362 | Specimen Optimisation for Compressive Fatigue Testing of Thick Composites

Rout, Joshua; Allen, Tom; Battley, Mark

12h50

1364 | Optimal of honeycomb composite structures for attenuating vibration induced noise radiation in ducts

Yi, Gyuyoung; Park, Junhong

13h10

—online—

1070 | Buckling of compressed orthotropic cylindrical panel resting on elastic curvilinear foundation with nonlinear change of transverse displacement over the thickness

Morozov, Evgeny; Lopatin, Alexander; Shatov, Alexander

— Break —

Thursday, September 5 (Mid-morning)

Room GIUSTINIANO

Session chair: Marco Gigliotti

Session chair: Stefano Valvano

Analysis of natural fibre composites and bio-inspired design of composites

12h10

1086 | Development of an innovative powder adhesive based on epoxy-polyester and lignin for production of particleboards

Němec, Miroslav; Pipiška, Tomáš; Hájková, Kateřina; Král, Pavel; Hýsek, Štěpán

12h30

1345 | Enhanced mechanical properties of hydrogel reinforced by microcrystalline celluloses

Yang, Qingsheng; Liu, Xia; Wu, Mengfei; Liu, Jun-Jie

12h50

—online—

1295 | Tensile response of NTRM composites analysed by multilinear analytical approaches Vs. cohesive zone models

Monaco, Alessia; Baldassari, Mattia; Cornetti, Pietro

13h10

—online—

1395 | OUT OF PLANE RETROFIT OF EXISTING MASONRY WITH NATURAL FIBERS

Miano, Andrea; Belliazzi, Stefano; Ramaglia, Giancarlo; Lignola, Gian Piero; Fabbrocino, Francesco

— Break —

Thursday, September 5 (Mid-morning)

Room GALLA PLACIDIA

Session chair: Joao Reis

Session chair: Ricardo De Medeiros

Experimental Methods

12h10

—online—

1138 | A new experimental method for determining the interlaminar failure envelope of thick-section composites

Liu, Liu; Hao, Ziqing

12h30

1057 | Experimental and Numerical Study on the Buckling of Cylindrical CFRP Shells under Multiaxial Loading

Panek, Stefan; Reuter, Niklas; Hartwich, Tobias S.; Kriegesmann, Benedikt; Krause, Dieter

12h50

1218 | Experimental Study of failures of air conditioners system tram in desert areas by applying preventive maintenance (Using reliability lows)

Lemnaouer, Khaled; Messaoud, Louafi; Zoubir, Aoulmi; Mounia, Taleb

13h10

1355 | Chloride removing in cement-based composite by electrochemical chloride extraction (ECE)

Jung, Ho Seop; Ann, Ki Yong; Jeon, Hye-Kyoung; Hong, Jae Hoon; Jang, Sung-Hwan

— Break —

Thursday, September 5 (Afternoon)

Room DANTE

Session chair: Claudio Mingazzini

Session chair: Jacopo Agnelli

Sustainable, recyclable and recycled composite materials (chaired by C. Mingazzini)

14h30

1314 | Innovative Approaches to Recycling Fiber-Reinforced Polymer (FRP) Composites: A Comprehensive Review

De, Maitrayee; Danda De, Gargi

14h50

1351 | Mechanical properties of inorganic polymer-based fiber-reinforced composites under fatigue loading

Natali Murri, Annalisa; Papa, Elettra; Landi, Elena; Mingazzini, Claudio; Scafè, Matteo; Medri, Valentina

15h10

1361 | Corrosion behaviour of ferronickel slag mixed mortar exposed to chloride-bearing environment

Jung, Ho Seop; Ann, Ki Yong; Park, Kwang-pil; Hong, Jae Hoon; Jang, Sung-Hwan

15h30

1393 | FML composites for fire resistant battery boxes: comparison of sandwich and monolithic structures in terms of mechanical performances

Mingazzini, Claudio; Scafè, Matteo; Creonti, Gianluigi; Benco, Enrico; Bassi, Stefano; Leoni, Enrico; Delise, Tiziano; Mariani, Edoardo

15h50

1398 | HEMP-BASED NATURAL FIBER COMPOSITES FOR CARBON DIOXIDE STORAGE

Agnelli, Jacopo; Meschini, Goffredo; Mannini, Federico; Lerzio, Marco; Fantuzzi, Nicholas

16h10

1403 | Self-compacting concrete with recycled coarse aggregate from demolition of Large Panel System – modified Equivalent Mortar Volume method in mix design

Malazdrewicz, Seweryn; Ostrowski, Krzysztof Adam; Sadowski, Lukasz

16h30

—online—

1390 | Sustainable FML (Fibre Metal Laminates) composite battery boxes for automotive electrification: improving thermal and fire management and corrosion resistance

De Aloysio, Giulia; Mingazzini, Claudio; Laghi, Luca; Morganti, Mattia; Ghetti, Leonardo; Mariani, Edoardo

16h50

1179 | FILLING EPOXY WITH SEAWASTE: MECHANICAL AND MORPHOLOGICAL CHARACTERIZATION OF A NOVEL FAMILY OF SUSTAINABLE COMPOSITES

Santulli, Carlo; Fragassa, Cristiano; Latini, Mattia; Micozzi, Fabio; Nikolic, Danilo

— End of the day —

Thursday, September 5 (Afternoon)

Room TEODORICO

Session chair: Mantas Atutis

Session chair: Sebastian Dominik Dillen

Composite structures and materials

14h30

1019 | Experimental research of composite cylindrical shell type offshore structure

Atutis, Mantas

14h50

1037 | The method for assembling -bar tensegrity units into a regular polyhedral tensegrity structure

Luo, Ani; Qiao, Guangrui; Liu, Heping

15h10

1025 | Post-buckling analysis of composite plates including bending twisting coupling

Dillen, Sebastian Dominik

15h30

1033 | An adaptive learning method based on multi-fidelity Kriging model and metaheuristic algorithm for multiscale reliability analysis of composite structures

Meng, Debiao; Yang, Shiyuan; Zhu, Shun-Peng; Fantuzzi, Nicholas

15h50

1036 | ANALYSIS FOR DEFORMATION OF THE 3-BAR TENSEGRITY STRUCTURE

Liu, Heping; Xing, Guangzhen; Luo, Ani

16h10

1367 | Predicting Effective Characteristics and Measuring Dynamic Properties of Mineral Casting for Enhanced Vibration Damping

Kim, Narae; Jang, Yeonjin; Gu, Kyunglae; Janghui Chan

16h30

—online—

1017 | Generalized Differential Quadrature for the static and free vibration analysis of doubly-curved shells made of advanced innovative materials employing higher order theories

Tornabene, Francesco; Viscoti, Matteo; Dimitri, Rossana

16h50

1404 | Effects of carbon nanomaterials on the interfacial properties of carbon fiber reinforced epoxy resin composite

Yu, MingMing

— End of the day —

Thursday, September 5 (Afternoon)

Room GIUSTINIANO

Session chair: Carlo Santulli

Session chair: Diego Magela Lemos

Dynamics of composite structures

14h30

1157 | Influence of Distinct 3D Printing Layer Patterns on the Dynamic Characteristics of Composite Structures

Raza, Ali; Rimašauskienė, Rūta

14h50

1163 | Nonlinear flutter analysis of bistable composite shells

Lemos, Diego Magela; Marques, Flávio D.; Ferreira, António J.M.

15h10

1172 | Failure analysis of the fuel storage compartment of a hydrogen powered vehicle made in composite materials.

Papavassiliou, Alessandro; Minak, Giangiacomo; Pavlovic, Ana

15h30

1164 | Design of dynamic properties for an-isotropic rubber bushings based on contact theory.

Jeon, Jonghoon; Yi, Gyuyoung; Park, Junhong

15h50

1173 | Analysis of Compressed Helical Spring Dynamic Characteristics: Exploring the Effects of Boundary Conditions using Camera Vision Technology

Jang, Yeonjin; Jeon, Seongwook

16h10

—online—

1203 | Dynamic response analysis of delaminated composite plates using a Finite Element based Reduced Order Model

Jansen, Eelco

16h30

1180 | Tunable composite metamaterials for vibration and impact mitigation

Kim, Eunho; Kim, Geunil; Kim, Kijung; Bae, Kwakjin; Yu, Jaesang

Hybrid composites: Material, Processes and durability (chaired by A. Makradi, S. Belouettar, J. Barkanovs)

16h50

1050 | Intelligent tool design for a closed-loop injection molding process of polymer-based hybrid composites

Volk, Michael; Schukraft, Joël; Weidenmann, Kay

— End of the day —

Thursday, September 5 (Afternoon)

Room GALLA PLACIDIA

Session chair: Seong Su Kim

Session chair: Christian Mittelstedt

Smart composites and structures

14h30

—online—

1222 | A Smart Soft Gripper Embedded with Flexible Composite Sensor for Tomato Harvesting

Xie, Weigui

14h50

1054 | Effect of the external pressure on Li-ion pouch cell and development of multi-functional composite battery exterior at high C-rate conditions

Lee, Ha Eun; Jeon, Doyun; Jo, Hyeonseong; Kim, Seong Su

15h10

1065 | Hybrid actuator utilizing shape memory alloy and polymer composite in a two-way mechanism

Kang, Dajeong; Aditya, Yitro Samuel; Kim, Seong Su

15h30

1074 | Buckling of Hinged Composite Booms for spacecraft deployable structures

Taylor, Alfred; Bai, Jiang-Bo; Wang, Zhenzhou

15h50

1347 | Topology optimization of hard-magnetic soft laminates for wide tunable SH wave band gaps

Alam, Zeeshan; Sharma, Atul Kumar

16h10

1384 | Shape-Change Morphing of Tensegrity V-Expander Plate Metamaterials

Chen, Muhao; Fraddosio, Aquinaldo; Micheletti, Andrea; Pavone, Gaetano; Piccioni, Mario Daniele

Analysis of sandwich, adaptive, morphing and variable stiffness composites

16h30

1060 | Process-Structure Properties of Polymer-Metal Sandwich Composites manufactured by in-situ Injection Molding

Morbitzer, Philipp; Schukraft, Joél; Lohr, Christoph; Weidenmann, Kay

16h50

1088 | Ritz-Legendre approach for capturing the mode jumping phenomena in variable-stiffness composite fuselage panels

Alhajahmad, Ahmad; Mittelstedt, Christian

— End of the day —

Friday, September 6 (Early-morning)

Room DANTE

Session chair: Shuxin Li

Session chair: Marco Riva

Delamination, damage, fracture, failure and durability of composites

09h00

1024 | Mechanism based Paris Law Approaches for Delamination Growth Characteristics of Composite Laminate under Fatigue Loading

Li, Shuxin; Duan, Qingfeng; Hu, Haixiao; Cao, Dongfeng

09h20

—online—

1044 | Trustworthy virtual testing beyond coupons: Failure modeling of large-scale composite wind turbine blades

Chen, Xiao

09h40

1301 | Numerical and experimental investigation of non-linear response in Ceramics Matrix Composite for reusable space vehicles

Riva, Marco; Novembre, Edoardo; De Stefano Fumo, Mario; Cavalli, Lorenzo; Airoidi, Alessandro

10h00

—online—

1030 | Multiscale-based multiaxial fatigue model of short fiber reinforced polymer composites under high-cycle proportional loading

Zhang, Lei; Zhang, Hanyu; Liu, Zhao; Zhu, Ping

10h20

1319 | Effect of damage evolution on low-velocity impact simulation of Kevlar-fibre woven composites

Zhang, Shunqi; Ma, Dayou; Manes, Andrea

10h40

1118 | STRAIN RATE-DEPENDENT PERFORATION OF WOVEN FIBRE COMPOSITES UNDER IMPACT

Ivančević, Darko; Ratković, Jakov

— Break —

Friday, September 6 (Early-morning)

Room TEODORICO

Session chair: Katarzyna Falkowicz

Session chair: Stefano Valvano

Thermal problems on composite structures

09h00

1121 | Thermal Buckling Analysis of Composite Laminated Profiles

Falkowicz, Katarzyna

09h20

1178 | Influence of mullite and halloysite reinforcement on the ablation properties of epoxy composite

Szczepaniak, Robert; Przybytek, Paweł; Piątkiewicz, Michał; Gryc, Dominik; Woroniak, Grzegorz

09h40

1206 | Thermal-stress analysis of a composite hydrogen storage system for aerospace applications

Valvano, Stefano; Maligno, Angelo

10h00

1276 | High-temperature operation of alkali-activated slag porous composite material

Vaičiukynienė, Danutė; Tamošaitis, Gintautas; Jaskaudas, Tomas; Nizevičienė, Dalia; Vaičiukynas, Vilimantas; Žurinskas, Darius; Bistrickaitė, Reda; Stelmokaitis, Gediminas; Viliūnienė, Odeta

10h20

1368 | Experimental study of the thermal properties of EPDM used as thermal insulator in solid rocket motor

Li, Wenbin; Wang, Xian; Hu, Zhang

Use of innovative composites materials for the strengthening of historical and archaeological sites (chaired by S. Belliazzi, F. Fabbrocino, G. Ramaglia)

10h40

1391 | An innovative approach to retrofit heritage masonry buildings

Ramaglia, Giancarlo; Belliazzi, Stefano; Fabbrocino, Francesco; Gian Piero Lignola

— Break —

Friday, September 6 (Early-morning)

Room GIUSTINIANO

Session chair: Xuefeng Yao

Session chair: Ana Neves

Advanced numerical techniques for composite structures and materials

09h00

1069 | Dynamic modelling of rotating axially functionally graded pre-twisted blades with chord length variations

Lotfan, Saeed; Cigeroglu, Ender

09h20

—online—

1186 | A Molecular dynamics study on the mechanical properties of Nylon-6/SiO₂ nanocomposites

Wu, Jiaojiao; Teng, Kang; Shim, Victor P.W.; Liu, Bo

09h40

1146 | Damage and repair of honeycomb absorbing structures

Yao, Xuefeng

10h00

—online—

1252 | Thermoforming simulation of CFRTP prepregs for enhanced component performance

Zheng, Shaojie; Jiang, Shengda; He, Ji

10h20

1193 | FE modeling of FRCM reinforced curved pillars under shear tests: Employing classical cohesive contact and user-defined material in ABAQUS

Yuan, Yu; Milani, Gabriele; Yongjing Tang

10h40

—online—

1267 | A novel finite element model for predicting elasto-plastic progressive damage in composite materials

Jin, Zenggui; Yang, Fengpeng

— Break —

Friday, September 6 (Early-morning)

Room GALLA PLACIDIA

Session chair: Marco Gigliotti

Session chair: Francesco Ascione

Durability and aging of composite materials and structures: Civil, Marine, Automotive, Aeronautical and Aerospace Applications (chaired by M. Gigliotti, F. Ascione)

09h00

1136 | The Effect of Thermal Cycling on Degradation and Damage of Ti/C-epoxy Adhesive Joints for Aeroengines Applications

Lazzini, Camilla; Gigliotti, Marco; Lainé, Eric; Balaciart Orenes, Salvador; Fanteria, Daniele; Bousses, Yoan; Minervino, Matteo

09h20

1353 | Determination of structural limit arising from steel corrosion-induced rust formation in steel-concrete composite section

Ann, Ki Yong; Jeon, Hye-Kyoung; Hwang, Woongik

09h40

—online—

1134 | An innovative ductile connection for fiber reinforced materials

Ascione, Francesco; Leonardi, Alessandro; D'Aniello, Mario

10h00

1304 | Durability of Pultruded Fiber-polymer Composite Structures Exposed to Different Environmental Conditions

Liu, Lulu; Keller, Thomas

10h20

1411 | Evaluation of Strength Composite Cross Joint Reinforced by I-fiber Stitching

Choi, Jae-Hyeok; Choi, Jin-ho; Yoon Dong-hwan; Hwang Min-sung

Composite structures and materials

10h40

1413 | Crosspreg, the innovative composite system, mass productive, hybrid reactive, thermoplastic behaving, to lightweight in circular economy

Creonti, Gianluigi

— Break —

Friday, September 6 (Mid-morning)

Room DANTE

Session chair: Piotr Smarzewski

Session chair: Krzysztof Adam Ostrowski

Composites in concrete-based structures

11h30

—online—

1128 | Seismic Performance of RC T-Beams Strengthened in the Negative Moment Region with UHPC Layer

Anjana, Muhammad Syauqi; Haryanto, Yanuar; Nugroho, Laurencius; Hsiao, Fu-Pei; Hu, Hsuan-Teh; Wu, Jheng-Sheng

11h50

1011 | Synergy of steel, polypropylene, basalt and glass fibers in high performance concrete composites

Smarzewski, Piotr

12h10

1072 | The influence of fiber and mesh reinforcement on the mechanical and static properties of high-strength fiberglass concrete composites.

Bibora, Petr; Leber, Pavel

12h30

1223 | Offshore floating wind turbine foundation revolution enabled by FRP reinforced ultra-high-performance concrete structures: development, durability and aero-hydrodynamic analysis

Zeng, Junjie; Fan, Tianhui; Zhuge, Yan; Su, Tianhang

12h50

1286 | The influence of perforated CFRP tubes on the load-bearing capacity of self-compacting concrete

Ostrowski, Krzysztof Adam; Piechaczek, Marcin; Sikora, Oliwia

13h10

—online—

1408 | Modelling of static behavior of FGM concrete beams with the addition of GNPs

Malikan, Mohammad; Rucka, Magdalena; Woźny, Błażej

— Break —

Friday, September 6 (Mid-morning)

Room TEODORICO

Session chair: Ana Neves

Session chair: Woongik Hwang

Delamination, damage, fracture, failure and durability of composites

11h30

1254 | Thermal shock resistance and shear performance degradation at intermediate temperature of 2D SiC/SiC

You, Bojie; Zhang, Yi; Ma, Xuehan; Gao, Xiangyun

11h50

—online—

1224 | Reinforced crack propagation in a prestressed and prepolarized piezoelectric material

Ghita, Gilbert-Marius-Daniel; Craciun, Eduard-Marius

12h10

1325 | The influence of mechanical couplings on the thin-walled composite plates behaviour

Kazmierczyk, Filip; Zaczynska, Monika

12h30

—online—

1120 | Characterisation of Crack Type Damage in Fiber Reinforced Polymer Composites using Digital Image Correlation and Finite Element Updating

Vaitkunas, Tomas; Jasiuniene, Elena; Griskevicius, Paulius

12h50

1352 | Cross-sectional damage of reinforced concrete structure against steel corrosion and axial load

Hwang, Woongik; Jung, Ho Seop; Ann, Ki Yong

13h10

1300 | Non-Deterministic Investigation of Composite Microstructure Effects on Macroscale Properties

TerMaath, Stephanie; Handy, Ashley; Crusenberry, Cody; Ytuarte, Ernest; Bezem, Kinan

— Break —

Friday, September 6 (Mid-morning)

Room GIUSTINIANO

Session chair: Jüri Majak

Session chair: Michele Baccocchi

Advanced numerical techniques for composite structures and materials

11h30

1015 | Arbitrarily shaped laminated thin plates in nonlocal elasticity: a finite element solution based on Hermite isoparametric mapping

Baccocchi, Michele; Fantuzzi, Nicholas

11h50

—online—

1012 | Mechanical Behaviour of 3D Printed Carbon Fibre Reinforced Composite Metastructure with Various Filling Rates

Wang, Kaibao; Liu, Yang; Chen, Yao; Chen, Hongwei; Le, Huirong

12h10

1034 | Vibration, Buckling and Bending Analysis of Composite Structures via Higher Order Haar Wavelet Method

Majak, Jüri; Mehrparvar, Marmar; Kivistik, Lenart; Karjust, Kristo; Eerme, Martin

12h30

—online—

1160 | An efficient augmented finite element method for arbitrary cracking and crack interaction in solids with mix-mode cohesive element

Lu, Maoxu; Hao, Ziqing; Liu, Liu

12h50

1039 | AN EXACT 3D ELECTRO-ELASTIC SHELL MODEL FOR STATIC AND FREE VIBRATION ANALYSIS OF SMART STRUCTURES

Brischetto, Salvatore; Cesare, Domenico

13h10

—online—

1161 | Meshless analysis of fracture propagation in adhesively bonded double-lap joints

Gonçalves, Diogo C.; Ramalho, Luis D.C.; Campilho, Raul D.S.G.; Belinha, Jorge

— Break —

Friday, September 6 (Mid-morning)

Room GALLA PLACIDIA

Session chair: Raffaella Rizzoni

Session chair: Seong Su Kim

Multi-scale analysis of composites

11h30

—online—

1100 | Dynamic tensile deformation and failure mechanism of the -HMX single crystal and polycrystal with defect distribution

Liu, Rui; Huang, Longjie; Chen, Pengwan

11h50

1051 | Multiscale modelling of a bimorph piezo-actuator made of nano-inclusions reinforced PVDF

Salah, Elbarnaty; Wiyao, Azoti; João Pedro, De Magalhaes Correia; Said, Ahzi

12h10

—online—

1323 | Transverse failure prediction of unidirectional carbon fiber reinforced polymer composites subjected to uniaxial and biaxial loading by stress-triaxiality-dependent computational micromechanics

Ji, Chenhao; Zhai, Yunong; Li, Dongsheng; Qu, Hao

12h30

1068 | Multi-physics modeling for composite processing and optimization for thick and multi-directional prepregs

Sarfraz, Muhammad Salman; Bae, Sangyoon; Kim, Wonvin; Kim, Seong Su

12h50

—online—

1318 | A hierarchical beam model in the framework of data-driven computational homogenization method

Hui, Yanchuan; Liu, Yutong; Liu, Jiequan; Giunta, Gaetano; Liu, Xiao; Hou, Dongxu; Hu, Heng; Yang, Jie; Huang, Qun

13h10

1234 | Concentration tensors in micropolar periodic laminates with imperfect interfaces

Rizzoni, Raffaella; Serpilli, Michele; Rodriguez-Ramos, Reinaldo; Lebon, Frédéric; Espinosa-Almeyda, Yoanh; Raffa, Maria Letizia; Serge Dumont

— Break —

Friday, September 6 (Afternoon)

Room DANTE

Session chair: Shahrzad Daghighi

Session chair: Paul Weaver

Recent Developments and Challenges in Design and Manufacturing Composite Pressure Vessels (chaired by P.M. Weaver, S. Daghighi)

14h30

1032 | Multi-dimensional collaborative design of composite pressure vessel via failure mechanism based modeling

Mou, Xing; Zhang, Qian; Zhang, Guiming; Fu, Jianhui; Zu, Lei

14h50

1055 | Isotenoid design and manufacture of Type V composite pressure vessels for mobility using automated fibre placement

Air, Alexander; Oromiehie, Ebrahim; Prusty, B. Gangadhara

15h10

1092 | Virtual characterization of the rate- and temperature-dependent mechanical properties of composite materials for hydrogen pressure vessels

Toenjes, Marco; Drechsler, Klaus

15h30

1094 | Roadmap for production of large-format composite pressure vessels for storing cryogenic hydrogen in the commercial vehicle sector

Vogl, Sylvester; Toenjes, Marco; Drechsler, Klaus

15h50

1095 | Advantages of Tow Steering for the Next Generation of Composite Pressure Vessels for Hydrogen Storage

Daghighi, Shahrzad; Weaver, Paul M.

16h10

—online—

1184 | Design Optimisation of a Conformal Composite Liquid Hydrogen Tank

Ramaswamy, Karthik; Wehrle, Erich

16h30

1099 | A fast multi-scale modeling analysis for progressive damage failure of composite over-wrapped pressure vessel (COPV) under thermo-mechanical loads

Li, Haiyan; Xin, Chang; Cheng, Huang

— End of the Conference —

Friday, September 6 (Afternoon)

Room TEODORICO

Session chair: Domagoj Lanc

Session chair: Antonio Coluccia

Functionally graded and porous materials and structures

14h30

1151 | FE thermal buckling analysis of FG porous thin-walled beams

Kvaternik Simonetti, Sandra; Lanc, Domagoj; Turkalj, Goran; Banić, Damjan

14h50

1310 | Modelling Porous Plates with In-Plane Functionally Graded Porosity Distribution Using Classical and Non-Classical Theories: Application to Dental GBR Meshes

Rezaei, Abdolmajid; Izadi, Razie; Fantuzzi, Nicholas

15h10

1170 | Stress concentration optimization for functionally graded plates with various holes and cutouts

Abdalla, Hassan Mohamed Abdelalim; De Bona, Francesco; Casagrande, Daniele

15h30

1238 | THERMAL EFFECTS ON MIXED-MODE FRACTURE IN FUNCTIONALLY GRADED MATERIALS USING AN ADAPTIVE PHASE FIELD APPROACH

Shajan, Anna Mariya; Piska, Raghu; Sundararajan Natarajan

15h50

1116 | Free Vibration Analysis of Porous Beams Via Numerical and Artificial Neural Network Approach

Çelik, Murat; Özdilek, Emin Emre; Gündoğdu, Emircan; Demirkan, Erol

16h10

1410 | Fatigue behavior of 316L steel structural lattice beams under four-points-bending symmetric cyclic loading

Coluccia, Antonio; De Pasquale, Giorgio

16h30

—online—

1274 | Investigating crack behavior in porous functionally graded materials through a thermo-mechanically coupled peridynamic model

Yapor Genao, Francisco; Rakici, Semsı; Kim, Jinseok

— End of the Conference —

Friday, September 6 (Afternoon)

Room GIUSTINIANO

Session chair: Victor Eremeyev

Session chair: Tayong Boumda Rostand

Advanced numerical techniques for composite structures and materials

14h30

—online—

1370 | An effective modeling strategy for simulating crack propagation mechanisms inside nano-filled composite structures under general loading conditions

Ammendolea, Domenico; Fabbrocino, Francesco; Leonetti, Lorenzo; Lonetti, Paolo; Pascuzzo, Arturo

14h50

1199 | Experimental characterization and numerical modeling of viscoelastic behaviour of woven prepregs during compression molding

Dong, Ruihan; Bao, Zuguo; Xuan, Chen; Yu, Hao

15h10

1230 | A multi-fidelity neural network model for fiber-reinforced composites

Lin, Congjian; Lou, Junbin; Wang, Guannan

15h30

1324 | A physics-informed ANN-based framework for generating representative constitutive model of composite materials

Shi, Tianxiang; Zhang, Yongqiang

15h50

—online—

1416 | Closed form solution of the elastoplastic constitutive relation in three-dimensional solids

De Angelis, Fabio

Multi-scale analysis of composites

16h10

1309 | Multiscale Fracture Modelling of Nano Fibrous Composite by bridging Molecular Dynamics and Peridynamics

Izadi, Razie; Fantuzzi, Nicholas

16h30

1341 | Coarse-grained molecular dynamics simulation of hydrogel microstructures

Zong, Ting; Liu, Xia; Yang, Qingsheng

— End of the Conference —

Friday, September 6 (Afternoon)

Room GALLA PLACIDIA

Session chair: Salim Belouettar

Session chair: Ahmed Makradi

Hybrid composites: Material, Processes and durability (chaired by A. Makradi, S. Belouettar, J. Barkanovs)

14h30

1052 | Thermoforming Process of Thermoplastic-Fibre Metal Laminate Composites: Modelling, Simulation and Experimentation.

Makradi, Ahmed; Bahtiti, Issam; Laachachi, Abdelghani; Belouettar, Salim; Zopp, Camilo; Kroll, Lothar; Barkanov, Evgeny; Başaran, Mustafa

14h50

1073 | Characterization of Thermoplastic Lamina Properties from Vibration Tests of Hybrid Composite Panels

Barkanov, Evgeny; Akishin, Pavel; Bahtiti, Issam; Kroll, Lothar

15h10

1089 | Finite Element Modelling of Stamp Forming Processes for Thermoplastic Fiber Metal Laminates

Akishin, Pavel; Barkanov, Evgeny; Makradi, Ahmed; Belouettar, Salim

15h30

1104 | Comparative studies on aluminium alloys / CFRP hybrids: Influence of surface modification, joining processes and climatic as well as corrosive stresses on the mechanical properties

Meinhard, Dieter; Nester, Sara; Knoblauch, Volker

15h50

1124 | Study on adhesively joined steel-CFRP hybrids for the digitisation of material data: Influence of surface pre-treatment on mechanical strength and fracture mechanics

Bosch, Johannes; Meinhard, Dieter; Taha, Iman; Knoblauch, Volker; Drechsler, Marc

16h10

1412 | Modifying Stiffness Degradation Model and Validation Using Non-Destructive Modal Analysis in Glass Fiber-Reinforced Composites Under Fatigue Loading

Valizadeh, Pouya; Ahad, Zabett; Jalil Rezaeepazhand

Probabilistic models for composites

16h30

—online—

1040 | An efficient reliability evaluation methodology for composite tubes using Artificial Neural Networks and Monte Carlo Simulation

Nair, Ajeesh Suresh; Ganesan, Rajamohan

16h50

—online—

1135 | Statistical analysis of the tensile strength in open-hole composite laminates: The effect of stacking sequence and material properties variability.

Danzi, Federico; Pagano, Luigi; Cumbo, Roberta; Kumar, Abhishek

— End of the Conference —

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1001 | Strength predictions of near-surface-mounted fibre-reinforced polymer shear-strengthened RC beams using machine learning approaches

Ke, Yan; Zhang, Shi-Shun; Jedrzejko, Mateusz-Jan; Lin, Guan; Li, Wen-Gui; Nie, Xue-Fei

1002 | ECCENTRIC LOADING TESTS ON STEEL-FREE CONCRETE COLUMNS REINFORCED LONGITUDINALLY WITH HYBRID BARS

Zhou, Jie-Kai; Teng, Jin-Guang; Zeng, Jun-Jie

1009 | Large deformable vibration of toroidal sandwich shells with auxetic honeycomb core and nanomaterial enriched coatings and under periodic/impulsive pressure

Mirfatah, Sayed Mohamad; Salehipour, Hamzeh; Ersoy, Hakan; Civalek, Ömer

1018 | Flexural behaviour of FRP-RC beams with FRP-UHPC hybrid rebars in compression zone

Liu, Yuxin; Zhang, Shi-Shun

1026 | Processing of inverse fibre-reinforced thermoplastic/metal laminates

Bahtiti, Issam; Zopp, Camilo; Kroll, Lothar

1027 | Study on compressive properties of GFRP confined concrete under coupled high temperature and lateral impact

He, Kang; Chen, Yu; He, Yaohui; Miao, Yushun

1042 | Investigating the Combined Effects of Geometrical and Material Properties on Fatigue Performance of Adhesively Bonded Composite and Steel Joints

Castro Sousa, Fernando; Akhavan-Safar, Alireza; Carbas, Ricardo; Marques, Eduardo; Goyal, Rakesh; Jennings, Justin; da Silva, Lucas

1105 | Energy release rate and mode partition solution for an edge-cracked thin circular laminated beam

Li, Yi; Yuan, Bo; Harvey, Christopher M.; Guo, Xiao Feng; Wang, Simon S.

1110 | Interfacial oxidation diffusion-chemical-thermal-mechanical coupling model for thermal barrier coatings

Gao, Junxiang; Guo, Xiaofeng; Yuan, Bo; Wang, Jianxin; Wu, Tianliang; Chang, Quanxi

1153 | Novel multifunctional pre-impregnated coatings for polymer matrix composites (PMC) - manufacturing technology and adhesion tests

Golewski, Przemysław

1166 | Multiscale Modeling of Glass Fiber Hierarchical Composites with Locally Engineered Microstructures for Structural Applications

Pothnis; Krishnappa, Shashidhar; Nagaraja, Abhilash; Gururaja, Suhasini

1176 | Injection Molding Glass Fiber-Reinforced Polypropylene: What is the Effect of Fiber Orientation on Mechanical Properties

Polat, Ayşe; Deliktaş Babür; Yazıcı Murat

1192 | Neural Network Modeling for Predicting the Elastoplastic Behavior of Short Fiber Reinforced Polymers

Tariq, Aiman; Polat, Ayşe; Deliktaş Babür

1202 | Influence of interfacial debonding on mechanical properties of finitely strained microstructured materials

Gaetano, Daniele; Greco, Fabrizio; Luciano, Raimondo; Pranno, Andrea; Sgambitterra, Girolamo

1207 | Tolerance modelling of vibrations of thin functionally graded cylindrical shells

Tomczyk, Barbara; Gołąbczak, Marcin; Bagdasaryan, Vazgen

- 1229 | A modified discrete shear quadrilateral element with assumed orthogonality bending energy and mixed transverse shear strains for isotropic and FGM sandwich plates**
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- 1240 | Monitoring the non-linear behaviour of concrete structures using the homogenisation principle**
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- 1247 | Study on microcracks and permeability of carbon fiber epoxy composites under ultra-low temperature cycling**
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- 1258 | Machine learning approach to modelling bond strength retention between Fibre Reinforced Polymer bar and concrete under seawater**
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1396 | Analysis of Debonding in NSM Strengthening Systems Using Structural Battery Reinforcement

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