



17h00	Online Session 1.2.19_Paper_139_Sequential and Iterative Method for Flux-linked Scalar Transport Equations in Multi-Physics Multi-Region Problems , <b>Raviteja Yakkala</b> (Indian Institute of Technology Madras)	Session 1.2.45_Paper_150_Two Time Scales Modelling of the Irreversible Deformation and Damage Accumulation in Metals and Metamaterials , <b>Dmytro Breslavsky</b> (National Technical University - Kharkiv Polytechnic Institute*)
17h20	Online Session 1.2.35_Paper_149_Numerical Simulation of Physico-Chemical Systems , <b>Emmanuel Amikya</b> (Ghana Institute of Management and Public Administration)	Session 1.2.7_Paper_178_Design of the Cryogenic Liquefied Hydrogen Corrugated Tank using Topology Optimization and Thermal Stress Analysis , <b>Song-Hyun CHA</b> (Korea Research Institute of Ships & Ocean Engineering)



July 2nd			
	Auditorium	Room A	Room B
	Session Chair: <b>Beatrice Pomaro</b>	Session Chair: <b>Moritz Frey</b>	Session Chair: <b>David Emerson</b>
	Multi-physics topics	Multi-scale topics	Multi-physics topics
09h00	Session 2.1.1_Paper_164_A 3D Coupled Thermo-Mechanical and Neutron Diffusion Model for Irradiated Concrete. <b>Beatrice Pomaro</b> (University of Padova)	Session 2.1.5_Paper_231_Homogenization of Mechanical Metamaterials with Self-contact Mechanisms for Programmable Stiffness Using Data-driven Constitutive Models. <b>Moritz Frey</b> (University of the Bundeswehr Munich)	Session 2.1.10_Paper_221_Design of High-Speed IPMSM Rotor Using CFRP Sleeves. <b>Si-Uk Jung</b> (Daegu University)
09h20	Session 2.1.2_Paper_180_Multi-physics, multi-scale modelling of droplet behavior in an electric field. <b>Alex Martynenko</b> (Dalhousie University)	Session 2.1.6_Paper_232_A 3-scale computational homogenisation strategy for sheet moulded compounds using material network surrogates. <b>Ujwal Kishore Jirga</b> (University of Liege)	Session 2.1.11_Paper_224_Fourth-order phase field modelling of crack initiation and propagation under combined thermo-mechanical loadings with strong form meshless method. <b>Izzat Ali</b> (Faculty of Mechanical Engineering, University of Ljubljana, Slovenia)
09h40	Session 2.1.3_Paper_183_Advancements in GS4-i-ROM: a unified time integration for coupled first-second order time-dependent problems. <b>Tao Xue</b> (Nanjing University of Science and Technology)	Session 2.1.8_Paper_244_Multi-scale industrial analysis of multilayered bending plates: The 2D+ approach. <b>Oriol Lloberas-Valls</b> (Universitat Politècnica de Catalunya)	Session 2.1.12_Paper_230_Partitioned Code Coupling for Multi-scale and Multi-physics Problems Through MJU Library. <b>David Emerson</b> (STFC Daresbury Laboratory)
10h00	Session 2.1.4_Paper_187_Coupled multi-physics simulation of light-material interaction in additive lithography for electronics. <b>Marwan Aarab</b> (Eindhoven University of Technology)	Session 2.1.30_Paper_317_A Comparative Review of Current Practices in Working Platform Design for Construction and Geotechnical Operations. <b>Amir Arabzadeh</b> (Swansea University)	Session 2.1.40_Paper_174_Numerical Assessment of Thermal Insulation System of a 6 CBM Liquid Hydrogen Fuel Tank for Maritime Applications. <b>Dong Hee Hong</b> (Korea Research Institute of Ships & Ocean Engineering)
10h20	Coffee Break		
10h40	Plenary Session 3 by Thomas J.R. Hughes @Auditorium		
	Auditorium	Room A	Room B
	Session Chair: <b>Isabelle Ramiere</b>	Session Chair: <b>Francisco Pires</b>	Session Chair: <b>Dimitrios Samaras</b>
	Multi-scale topics	Interdisciplinary topics	Multi-scale topics
11h30	Session 2.1.13_Paper_179_Towards second-order SFE+Q3 multiscale solutions for quasi-stationary thermal problems with a heterogeneous heat source. <b>Isabelle RAMIERE</b> (CEA)	Session 2.1.16_Paper_309_Common Riccati Stability and Time-Delay Systems. <b>Ali Algefiery</b> (Qassim University)	Session 2.1.19_Paper_249_Quantitative Analysis of Granular Explosives through Examination of Compaction Manufacturing Process. <b>Dimitrios Samaras</b> (Imperial College London)
11h50	Session 2.1.14_Paper_186_Optimal solutions and r-adaption employing an algebraic Variational Multiscale approach. <b>Suyash Shrestha</b> (UPM)	Session 2.1.17_Paper_313_Enhancement of a Crane Hook Design using Topology Optimization and AI-Based Generative Design for Weight Reduction. <b>Eren Kalay</b> (ITU)	Session 2.1.20_Paper_285_Efficient multiscale simulations of additively manufactured alloys at finite strain: Towards a hybrid approach combining FE2 and FE-ANN. <b>Arnoud Rademacker</b> (Université de Liège)
12h10	Session 2.1.15_Paper_201_Finite Element and Machine Learning-Assisted Multi-scale Simulation of Impact-Resistant Stitched Composite Shields. <b>Eduardo Sosa</b> (West Virginia University)	Session 2.1.18_Paper_134_A multi-physics model for the simulation of a cold breakdown plasma and its interaction with dielectric surfaces. <b>Andrea Barbarechi Villa</b> (RSE)	Session 2.1.21_Paper_288_Leveraging Full-field Meso-scale Models of Polycrystalline Materials to Hierarchically Propagate High-rate Inter-granular Fracture Mechanics to Macro-scale Models. <b>David Wason</b> (University of Oxford)
12h20	Session 2.1.22_Paper_297_Multiscale Automated Discovery Approach for Homogenized Material Identification in Metamaterials. <b>Mohammad Shojaei</b> (TU Darmstadt)	Session 2.1.50_Paper_314_Explicit Euler - Nonlocal Operator Method for Solving Transient Heat Conduction Problems. <b>Umud Sahin</b> (Istanbul Technical University)	Session 2.1.60_Paper_318_Constitutive modeling of twinning induced deformation at elevated temperatures for MP35N superalloy. <b>Ruijie Deng</b> (Harbin University of Science and Technology)
12h40	Lunch Break		
	Auditorium	Room A	Room B
	Session Chair: <b>Patrick Kopper</b>	Session Chair: <b>Xikai Jiang</b>	Session Chair: <b>Alessandra Paoloni</b>
	Multi-physics topics	Multi-physics topics	Multi-scale topics
14h00	Session 2.2.1_Paper_192_On Novel MPI+MPI Hybrid Techniques for Euler-Lagrange Simulations on Distributed Systems. <b>Patrick Kopper</b> (University of Stuttgart)	Session 2.2.7_Paper_275_Modelling of Bubble Breakage and Coalescence in Stirred and Sparged Bioreactor Using the Euler-Lagrange Approach Coupled with VOF. <b>Pavel Krysa</b> (UCT Prague)	Session 2.2.50_Paper_175_Using Computer Vision to predict microscale turbulent drag force in porous media. <b>Andrey Kuznetsov</b> (North Carolina State University)
14h20	Session 2.2.2_Paper_194_A High-Order Four-Way Coupled Euler-Lagrange Approach for Particle-Laden Flow. <b>Anna Schwarz</b> (University of Stuttgart)	Session 2.2.8_Paper_276_Scalar Mixing Characteristics of an Elevated Low Velocity Ratio Jet in Atmospheric Crossflow using IDDES. <b>Jiyas Yilmaz</b> (Istanbul Bilgi Univ)	Session 2.2.12_Paper_254_Multi-scale Analysis and Design of Materials: a Composite Bayesian Optimisation Strategy. <b>Rui Coelho</b> (FEUP)
14h40	Session 2.2.3_Paper_195_Influence of Nitrogen Concentration on the Fracture Mechanism of Nitrogen-Doped Gamma-Graphyne Monolayer, Bilayer, and Trilayer: A Molecular Dynamics Study. <b>Mahmoudreza Dehnavi</b> (IDMEC - Instituto Superior Técnico)	Session 2.2.9_Paper_281_Dynamics of charged particles in low-Reynolds-number fluids confined in general geometries. <b>Xikai Jiang</b> (Institute of Mechanics, Chinese Academy of Sciences)	Session 2.2.13_Paper_255_Mean Field Homogenization Based on the Principle of Multi-Scale Virtual Power and Its Dual: Application to Semi-Crystalline Polymers. <b>José Vila-Chã</b> (FEUP)
15h00	Session 2.2.4_Paper_196_Physics Informed Neural Networks for coupled radiation transport equations. <b>Laetitia LAGUZET</b> (CEA);	Session 2.2.10_Paper_284_Insights into Interfacial Reactions in Lithium Solid State Battery via Machine Learning Molecular Dynamics. <b>Ruitian He</b> (UCL);	Session 2.2.14_Paper_261_Surrogate Modelling for Global Sensitivity Analysis of Biomechanical Arterial Constitutive Models. <b>João Carlos Moutinho Gonçalves</b> (KU Leuven)
15h20	Session 2.2.5_Paper_199_Multi-Physical Modeling of Meta-Materials for mm-Wave Applications in the Outdoor Environment. <b>Roshan Gomez</b> (TU Dresden); Michael Kaliske (TU Dresden)	Session 2.2.31_Paper_265_An Iterative Method for Elastic Multiple Scattering Coupled with a High Order Local Farfield Expansion ABC. <b>Vianey Villamizar</b> (Brigham Young University)	Session 2.2.15_Paper_263_Toward a new PGD approach for the numerical simulation of elongated structures. <b>Frederic Legoll</b> (ENPC and Inria)
15h40	Session 2.2.6_Paper_208_Phase-field modeling of initiation and propagation of cracks in multiphase porous media due to thermal effects. <b>Ze-chao Chen</b> (University of Padova)	Session 2.2.40_Paper_298_Alex Martynenko_Numerical Investigation on Convective Heat Transfer Enhancement by Ionic Wind. <b>Dalhousie University</b>	Session 2.2.16_Paper_283_Discrete-to-Continuum Computational Homogenization of Lattice Materials. <b>Alessandra Paoloni</b> (Sapienza University of Rome)
16h00	Coffee Break		
	Auditorium	Room A	Room B
	Session Chair: <b>V Mithlesh Kumar</b>	Session Chair: <b>Francesca Braccaglia</b>	Session Chair: <b>Gun Woo Kim</b>
	Multi-uncertainty topics	Multi-physics topics	Interdisciplinary topics
16h20	Session 2.2.17_Paper_240_Tackling challenges in Bayesian model selection with state-of-the-art techniques. <b>V Mithlesh Kumar</b> (RWTH Aachen University)	Session 2.2.21_Paper_287_Post-buckling and nonlinear thermal stress of laminated composite by CUF. <b>Francesca Braccaglia</b> (Politecnico di Torino)	Session 2.2.32_Paper_305_A Numerical Method for Solving Maxwell's Equations in Singular 3D Geometry. <b>Irina Raichik</b> (Bar Ilan University)
16h40	Session 2.2.18_Paper_202_A Kriging-assisted first order reliability method combining heuristic algorithms for efficient and accurate reliability analysis. <b>Shiyuan Yang</b> (University of Porto)	Session 2.2.22_Paper_294_Influence of Computational Cell Aspect Ratio on the Accuracy and Computational Cost of CFD Simulations of Gas-Accelerated Flat Sheet Jets. <b>Krištof Kovačić</b> (Faculty of Mechanical Engineering, University of Ljubljana)	Session 2.2.25_Paper_217_Numerical Assessment of Insulation System Design for 20 CBM Liquefied Hydrogen Tank using Concept of Cryogenic Sacrificial Fluid Shielding. <b>Gun Woo Kim</b> (Korea Research Institute of Ships & Ocean Engineering)
17h00	Session 2.2.19_Paper_310_Integrating Multi-Scale and Multi-Uncertainty Analysis in Structural Reliability Assessment. <b>Temple Njoku</b> (Swansea University)	Session 2.2.23_Paper_311_Image-Based simulation of porous insulation materials. <b>Liam Garcia</b> (Swansea University)	Session 2.2.26_Paper_219_Novel Concept Design for Efficient Storage and Carriage of On-board Captured CO <sub>2</sub> : Mid-ship Shaped Vertical Tri-Lobe LOO2 Tank. <b>Jinho Lee</b> (University of Science and Technology)



July 3rd

09h30

Plenary Session 4 \* Variational phase-field modeling of fracture: towards second-generation models.\* by **Laura De Lorenzis** @Auditorium

10h20

Coffee Break

Auditorium

Room A

Room B

Session Chair: **Alexandre Caboussat**

Session Chair: **Jianmin Qu**

Session Chair: **Katie Madine**

Multi-scale topics

Interdisciplinary topics

Multi-physics topics

10h40

Session 3.1.1\_Paper\_202\_Coupling incompressible Newtonian fluids, visco-elastic fluids, and elastic solids: an Eulerian model for multiphase flows\_ **Alexandre Caboussat** (University of Applied Sciences Western Switzerland (HES-SO))

Session 3.1.7\_Paper\_181\_Automated Characterization of Debonding based on Ultrasonic Guided Waves and A Simulation-Trained Deep Neural Network\_ **Jianmin Qu** (Stevens Institute of Technology)

Session 3.1.13\_Paper\_241\_Controlling flexural wave propagation on arrays of gyroscopes and beams, with negative refraction and asymmetric modes\_ **Katie Madine** (University of Liverpool)

11h00

Session 3.1.2\_Paper\_211\_Multiscale and Multiphysics Framework for Thermal and Structural Analysis of Load-Bearing Heat Exchangers in Sustainable Aircraft\_ **Girindra Ramgobin** (University of Leeds)

Session 3.1.8\_Paper\_235\_Surrogate model for solid-fluid interaction: a scalable neural-network approach\_ **Nathalie Pinheiro** (Imperial College London)

Session 3.1.14\_Paper\_247\_Evolution and Propagation of Pre-existing Crack in the Core of an Earth-Rockfill Dam Due to Reservoir Impoundment\_ **Anulekha Chakraborty** (IIT Guwahati)

11h20

Session 3.1.3\_Paper\_213\_Unravelling the Interplay between Mesh-Dependent Effects Across Spatial Scales with Second-Order Computational Homogenisation\_ **Guilherme Gonçalves** (DEMec, FEUP)

Session 3.1.9\_Paper\_268\_Predicting the Macro Compression Strength of Masonry via Probabilistic Discontinuum-Based Analysis\_ **Bora Pulatsu** (Carleton University)

Session 3.1.15\_Paper\_258\_Quantitative Assessment of Fracture Risk in Metastatic Vertebrae: An In Silico Approach\_ **Alkaios Lamprakis** (University College London)

11h40

Session 3.1.4\_Paper\_222\_Statistically compatible hyper-reduction for variationally consistent homogenization and its application to diffusion\_ **Jan Hauck** (Kiel University)

Session 3.1.10\_Paper\_278\_Alleviating Spurious Wave Reflection with Filters, Absorbing Layers and Artificial Neural Network Couplings\_ **Kin Fung Chan** (University of Oxford)

Session 3.1.16\_Paper\_264\_Parallel performance of the pseudospectral method applied to the kinematic dynamo problem\_ **Roman Chertovskih** (FEUP)

12h00

Session 3.1.6\_Paper\_228\_Continuous Unsteady Adjoint Variational Multiscale Method for airfoils applications\_ **Carlo Brunelli** (Royal Military Academy)

Session 3.1.11\_Paper\_279\_The Onsager principle as an approximation tool in multi-physics multi-scale problem\_ **Xianmin XU** (Chinese Academy of Sciences)

Session 3.1.18\_Paper\_274\_A discrete dual finite volume method for the convection-diffusion equation: toward cold-plasma modeling\_ **Thomas Bonnafont** (Lab-STICC, UMR CNRS 6285, ENSTA, IP Paris)

12h20

Session 3.1.5\_Paper\_277\_ICME Framework for design of Micro-alloyed electrical steels\_ **Akash Bhattacharjee** (CS Research, Tata Consultancy Services)

Session 3.1.20\_Paper\_141\_Computational methods in nondestructive evaluation at concrete floors in multisite facilities\_ **Lukasz Sadowski** (Politechnika Wroclawska)

Session 3.1.21\_Paper\_316\_Deformation Mode Coupling and Size Effects in Micro-Architected Materials: Multi-Scale Modelling, Additive Manufacturing and Experimental Validation\_ **Igor Rodrigues Lopes** (INEGI)

12h40

Lunch Break

Social Program