UKACM 2023 Annual Conference
University of Warwick
19th-21st April 2023

Conference Programme

Wednesday, 19th April

School on Advanced Topics

School will be held in Zeeman Building, Warwick campus.

12:15-13:00	**Conference Registration**	*Zeeman Building*
13:00-13:15	**Welcome** Dr Mohaddeseh Mousavi Nezhad *(Local organiser)*	Room MS01
13:15-14:00	**The interface between rigorous mathematical modelling, analysis, and high-performance computing in fluid mechanics (1)** Dr Radu Cimpeanu *(University of Warwick)*	Room MS01
14:15-15:00	**The interface between rigorous mathematical modelling, analysis, and high-performance computing in fluid mechanics (2)** Dr Radu Cimpeanu *(University of Warwick)*	Room MS01
15:00-15:30	**Break**	
15:30-16:15	**Modelling of coupled chemo-mechanical phenomena in solids (1)** Prof. Laurence Brassart *(University of Oxford)*	Room MS01
16:30-17:15	**Modelling of coupled chemo-mechanical phenomena in solids (2)** Prof. Laurence Brassart *(University of Oxford)*	Room MS01

Thursday, 20th April

Conference will be held in Zeeman Building.

8:30 - 9:15 9:00 - 9:15	**Conference registration** **Welcome and Opening** Dr Mohaddeseh Mousavi Nezhad *(Local organiser)* Prof. Rubén Sevilla *(President of the UKACM)*	*Zeeman Building* Room MS01
9:15-10:15	**Plenary lecture** Prof. Chris Pearce *(University of Glasgow)*	Room MS01
10:15-10:30	**Break**	
10:30-12:00	*Parallel session 1* *Parallel session 2* *Parallel session 3*	Room MS03 Room MS04 Room MS05
12:00-13:30	**Lunch Break**	
13:30-14:30	**Plenary lecture** Prof. James Sprittles *(University of Warwick)*	Room MS01
14:30-15:45	*Parallel session 1* *Parallel session 2* *Parallel session 3*	Room MS03 Room MS04 Room MS05
15:45-16:00	**Break**	
16:00-17:15	*Parallel session 1* *Parallel session 2* *Parallel session 3*	Room MS03 Room MS04 Room MS05
17:15-18:00	**UKACM Executive meeting**	Room A1.01
19:30-22:00	***Conference dinner***	Chancellors Suite

Friday, 21st April

Conference will be held in Zeeman Building.

9:00-10:00	**Plenary lecture** Prof. Alberto Guadagnini *(Politecnico di Milano)*	Room MS01
10:00-11:00	*Parallel session 1* *Parallel session 2* *Parallel session 3*	Room MS03 Room MS04 Room MS05
11:00-11:15	**Break**	
11:15-12:15	*Parallel session 1* *Parallel session 2* *Parallel session 3*	Room MS03 Room MS04 Room MS05
12:15-14:00	**Lunch Break**	
13:00-14:00	**UKACM Board meeting**	Room A1.01
14:00-15:00	**Plenary lecture** Prof. Stephane Bordas *(University of Luxembourg)*	Room MS01
15:00-15:30	**Closing lecture** Dr Jinlong Fu *(Swansea University)*	Room MS01
15:30-16:00	**Prize giving and closing session**	Room MS01

UKACM 2023 Conference – Morning Parallel sessions - Thursday 20th April

	Session 1: Failure and Damage – Room MS03 Chair: Dr Zahir Ullah		Session 2: Material Modelling – Room MS04 Chair: Dr Mohammad Rezania		Session 3: Computational Methods in Fluids – Room MS05 Chair: Dr Matteo Icardi	
	Title	***Speaker (Institution)***	***Title***	***Speaker (Institution)***	***Title***	***Speaker (Institution)***
10:30-10:45	Phase field modelling of pitting and stress corrosion cracking	Emilio Martinez-Paneda (Imperial College London)	Constitutive modelling of hydrolytic degradation in polymers	Zhouzhou Pan (University of Oxford)	A high-resolution, unified incompressible solver framework for turbulent flows in OpenFOAM	Tom-Robin Teschner (Cranfield University)
10:45-11:00	Transport of ionic species within fractures using a physics-based phase-field formulation	Tim Hageman (Imperial College London)	Simple strategy for calibration of AA2-DISP anisotropic clay model parameters	Hesamoddin Dejaloud (University of Warwick)	A coupled HDG-FV method for incompressible flows simulations	Agustina Felipe (Swansea University)
11:00-11:15	On a Timoshenko frame element for analysing the collapse of reinforced concrete frame structures considering both geometric and material nonlinearities	Gumaa Abdelrhim (University of Glasgow)	The history variables parameterisation of granular materials in Muti-layer Perceptron-based strain-stress modelling	Mengqi Wang (Swansea University)	Simulate Cavitation Bubble with Single Component Multi-Phase Lattice Boltzmann Method	Xin Xiong (Cranfield University)
11:15-11:30	The effects of bedding orientation on the hydraulic fracture trajectories in layered heterogeneous rocks	Nima Sarmadi (University of Warwick)	Constitutive formulation for self-healing fibre-reinforced concrete	Sina Sayadi (Cardiff University)	3-D modelling of unstable preferential flow in heterogeneous soil through Gaussian random fields	Evan J. Ricketts (Cardiff University)
11:30-11:45	An Investigation into the Methods for Modelling Pre-existing Cracks in Phase Field Fracture Problems	Bradley Sims (Durham University)	Ex vivo experimental investigations and constitutive modelling of the layer-dependent biomechanical behaviour of the human oesophagus	Ciara B Durcan (Swansea University)	Experimental and numerical study on gas-solid flow system of plastic pellets using recurrence quantification analysis of pressure sensor measurements	Osamh S Alshahed (University of Greenwich)
11:45-12:00	A Fast Fracture Plane Angle Search Algorithm on 3D Puck Failure Criterion	Nanda Wirawan (University of Sheffield)	An explicit FEM-NN framework and the analysis of error caused by NN-prediction	Shaoheng Guan (Swansea University)	Transient flow structures of pressurized cryogenic hydrogen jets	Zhaoxin Ren (Swansea University)

UKACM 2023 Conference – Afternoon (1) Parallel sessions - Thursday 20th April

	Session 1: Damage and Failure – Room MS03 Chair: Dr Emilio Martinez-Paneda		Session 2: Material Modelling – Room MS04 Chair: Dr Tanh Liem Vo		Session 3: Computational Methods in Fluids – Room MS05 Chair: Dr Mohaddeseh Mousavi Nezhad	
	Title	***Speaker (Institution)***	***Title***	***Speaker (Institution)***	***Title***	***Speaker (Institution)***
14:30-14:45	Phase Field Modelling the Hygroscopic Failure Behaviours of Composite Materials	Wei Tan (Queen Mary University of London)	Thin skin depths in magnetic objects for metal detection problems	James D Elgy (Keele University)	Numerical simulation of polarization and scaling in reverse-osmosis desalination membranes	Matteo Icardi (University of Nottingham)
14:45-15:00	Cone Penetration Tests (CPTs) in bi-phase soils: a material point approach with rigid body interaction	Robert Bird (Durham University)	Evaluation of nonlocal regularisation methods for sand models	Zhiwei Gao (University of Glasgow)	Effects of flow nonlinearity and spatial heterogeneity on dispersive solute transport in porous media: A pore-scale study	Hamid Moghimi (University of Warwick)
15:00-15:15	Numerical Investigation on Different Stages of Disbonding Failure and Matrix Cracking in Microscale Composites Under Transverse Compressive Load	Muhammad Faiz Hamzah (University of Sheffield)	A non-linear Riemann solver for large strain contact dynamics	Callum J Runcie (University of Glasgow)	A comparative computational study of tidal turbine arrays in West Anglesey demonstration zone	Ioannis Polydoros (Swansea University)
15:15-15:30	On the computational damage modelling of flexible wave energy convertors	Deepak George (Swansea University)	Uncertainty quantification of granular column collapse in heterogeneous sand via stochastic MPM	Guotao Ma (University of Warwick)	Prediction of passive drag using the immersed boundary method	Alexander Haskins (Queen's University Belfast)
15:30-15:45	High cyclic fatigue analysis with induced residual stress based on fracture mechanic	Xuran Xiao (University of Strathclyde)	Dynamics of deployable origami-based tubular metamaterials	Alok Kumar Tiwari (IIT Roorkee)	Comparative analysis of RANS and DDES methods for aerodynamic performance predictions for high performance vehicles	Steven Rijns (Cranfield University)

UKACM 2023 Conference – Afternoon (2) Parallel sessions - Thursday 20th April

	Session 1: Computational Methods in Solids – Room MS03 Chair: Dr Mohaddeseh Mousavi Nezhad		Session 2: Advances in Computational Methods – Room MS04 Chair: Dr Emmanouil Kakouris		Session 3: Machine Learning and Data-based Methods – Room MS05 Chair: Prof. Rubén Sevilla	
	Title	***Speaker (Institution)***	***Title***	***Speaker (Institution)***	***Title***	***Speaker (Institution)***
16:00-16:15	Mechanics of 3D printed bioresorbable stents: A virtual testbed assessment	Michael Okereke (University of Greenwich)	A novel entropy-stable Updated Reference Lagrangian Smoothed Particle Hydrodynamics algorithm for thermo-elasticity and thermo-visco-plasticity	Chun Hean Lee (University of Glasgow)	Multi-view learning for Bayesian optimization of structures in reduced dimension	Thomas Archbold (University of Cambridge)
16:15-16:30	Scalable agent-based modelling and simulation of biological tissue development	Roman Bauer (University of Surrey)	Mollified approximants for finite element analysis on polytopic meshes	Eky Febrianto (University of Glasgow)	Optimisation methods for computationally expensive design processes	Ben H Smith (Swansea University)
16:30-16:45	Three-dimensional semi-analytical investigation of interlaminar stresses in composite laminates	Mohammad Burhan (Queen's University Belfast)	Electrical conductivity of CNT-reinforced composites undergoing large deformation	Masoud Ahmadi (University of Glasgow)	Mixed finite element formulation for data-driven approach to diffusion problems	Adriana Kulikova (University of Glasgow)
16:45-17:00	Finite element modelling of macrosegregation during columnar solidification with higher-order finite elements	Richard Olley (University of Glasgow)	Smart structure dynamic stall suppression	Reza Moosavi (University of Hertfordshire)	Multi-scale design and optimisation of materials and structures	Eric Li (Teesside University)
17:00-17:15	Numerical simulation of the thermal conductivity of frozen soils using a modified quartet structure generation set	Huxi Xia (University of Warwick)	CPFEM model with DSA for thermos-mechanical fatigue analysis of titanium alloys	Syed Mustafa Kazim (IIT Kanpur)		

UKACM 2023 Conference – Morning (1) Parallel sessions - Friday 21 April

	Session 1: Computational Methods in Solids – Room MS03 Chair: Dr Xue Zhang		Session 2: Advances in Computational Methods – Room MS04 Chair: Dr Jose Luis Curiel-Sosa		Session 3: Machine Learning and Data-based Methods – Room MS05 Chair: Dr Andrei Shvarts	
	Title	***Speaker (Institution)***	***Title***	***Speaker (Institution)***	***Title***	***Speaker (Institution)***
10:00-10:15	Numerical investigation into the effects of geometrical alterations in cut-off walls on seepage through water-retaining structures	Alireza Ahangar Asr (University of Salford)	Extended B-Splines-based MPM for frictional contact problems	Emmanouil Kakouris (University of Warwick)	AI mesh-informed techniques for optimising the design process	Callum D Lock (Swansea University)
10:15-10:30	Piezoelectric material characterisation using the finite element model updating method	Ignatios Athanasiadis (University of Glasgow)	On the development of a material point method compatible arc length solver for large deformation solid mechanics	Nathan D Gavin (Durham University)	Direct data-driven optimisation of buckling loads of structures with stochastic imperfections	Tianyi Liu (University of Cambridge)
10:30-10:45	Modelling the drag force on non-spherical granular materials for industrial processes	Sadaf Marami (Newcastle University)	Geometry-persistent mesh generation tailored for NEFEM	Xi Zou (Swansea University)	A parametric non-linear non-intrusive reduced-order model by transfer learning and Auto-Encoder deep learning methods	Rui Fu (Swansea University)
10:45-11:00	Transversely curved honeycomb lattice metamaterials for enhancing mode-dependent specific stiffness: A computational investigation based on 3D degenerated shell elements	Mohit Awasthi (IIT Kanpur)	A geometrically-exact finite element method for micropolar continua with finite deformations	Ted J. O'Hare (Durham University)	Benchmarking self-attention-based deep learning models for transient inverse analysis	Wiera Bielajewa (Swansea University)

UKACM 2023 Conference – Morning (2) Parallel sessions - Friday 21 April

	Session 1: Computational Methods in Solids – Room MS03 Chair: Dr Mohaddeseh Mousavi Nezhad		Session 2: Advances in Computational Methods – Room MS04 Chair: Dr Tanh Liem Vo		Session 3: Machine Learning and Data-based Methods – Room MS05 Chair: Dr Zhaoxin Ren	
	Title	***Speaker (Institution)***	***Title***	***Speaker (Institution)***	***Title***	***Speaker (Institution)***
11:15-11:30	Simulation-augmented atomic force microscopy of cells	Andrei G. Shvarts (University of Glasgow)	Real-time domain decomposition of parametric elliptic PDEs via the proper generalised decomposition	Ben J Evans (Loughborough University)	Optimised hybrid machine learning approach for prediction of damage	Balaji Chandran (University of Nottingham)
11:30-11:45	Challenges of the PFEM for dynamic modelling of geotechnical problems with large deformation	Xue Zhang (University of Liverpool)	Towards the development of an in-silico computational tool for the simulation of floor borne vibrations in magnetic resonance imaging scanners	Yashwanth Sooriyakanthan (Swansea University)	Hyperparameter tuning of physics-informed neural networks for heat conduction problems	Prakhar Sharma (Swansea University)
11:45-12:00	Prediction of local buckling of composite cellular core in sandwich panel	Jasotharan Sriharan (University of Edinburgh)	Developing a numerical framework for the assessment of sand erosion effects in wind turbines	Yunus Samiepour Ardakani (University of Greenwich)	Computational heat transfer optimisation in nuclear fusion reactors using physics enhanced machine learning	Daniela Minerva Segura Galeana (Swansea University)
12:00-12:15	A novel Gradient Enhanced Kriging computational framework for large strain anisotropic constitutive models	Nathan S Ellmer (Swansea University)	Optimised locking-free four-noded quadrilateral Shell element	Ziqian Xu (Imperial College London)		