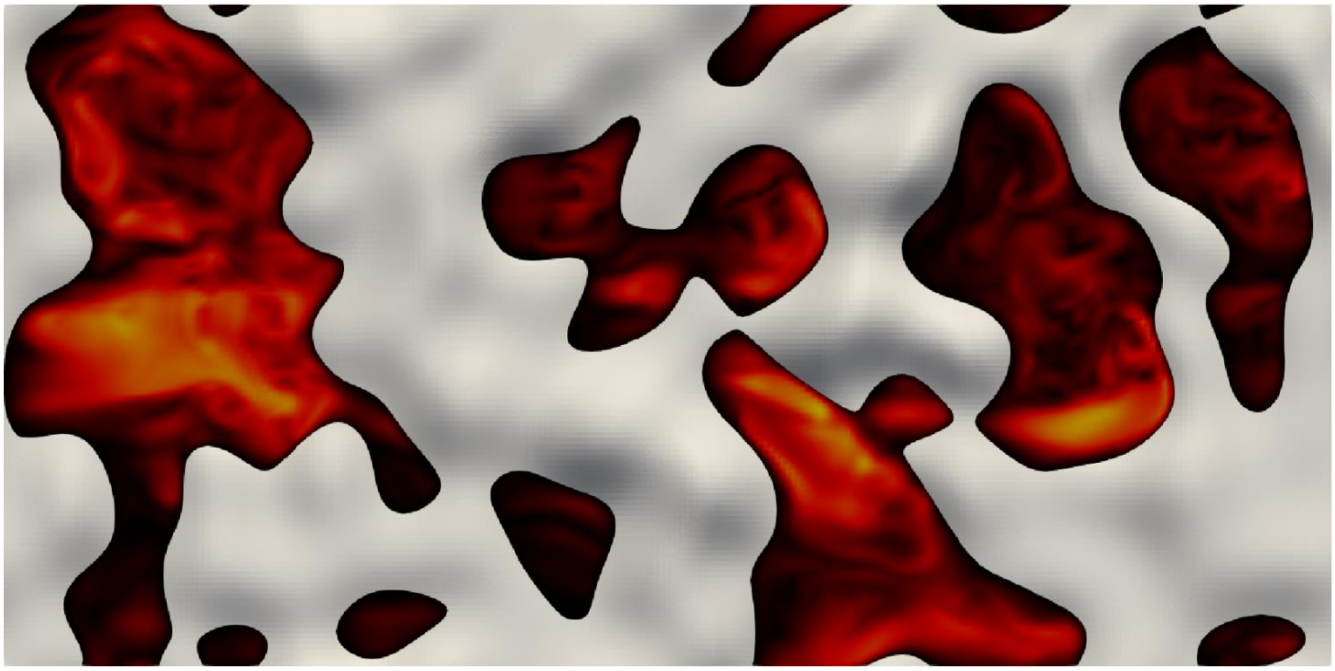

UK Fluids Conference
8th-10th September 2021
Programme

Welcome to the UK Fluids Conference 2021

Link to conference

You can access the conference site at this link: https://gather.town/invite?token=cSjYyniA

Instructions for all participants

If you haven't yet used Gather.Town, see https://gather.town/app/ZjoKsCgut1xMYH5L/Live%20Walkthrough or https://gather.town/app/p4B9DUqB8NAazd3t/DemoConference and the walk-through of our conference site on https://www.youtube.com/watch?v=gyP06pqQ-SQ. Make sure your browser works (Chrome or Firefox are the supported browsers, but not Safari) and you can navigate around the virtual world and share your camera and computer screen (this part is similar to Zoom/Teams etc). Any joining issues should be reported to ukfluids@soton.ac.uk (make sure you use exactly the e-mail you registered with). Note the use of 'x' to interact with content and 'g' to avoid blocking by other users. Note the speaking positions (orange spotlight squares) that you can move to and then heard by the whole room. Session chairs and speakers will use these during sessions.

Check presentation times in the final programme, since some have changed relative to the previous draft. Keep cameras and microphones **off** during plenary sessions on Teams and oral presentations in Gather.Town. Put cameras **on** during poster sessions and when interacting outside the oral sessions. Please leave the front row free in the lecture rooms for speakers. Ask questions after talks (orally via broadcast stations, or in the chat, noting the room letter A, B or C in the question, i.e. 'Room A, I have a question about …') and stay after sessions to meet authors of presentations in which you have a special interest. Say hello to the sponsors. If you get a red warning box about rooms being over the maximum, please put a note in the chat.

Prizes

You can vote for best student presentations and posters (highlighted in green in the schedule) via https://forms.office.com/r/M12W6YDE8T. Please do this before Thursday 18:00, to help the prizes committee make their choices.

Instructions for session chairs for parallel sessions (10 minutes talks, 2 minutes questions/changeover)

The role of session chairs is to keep the sessions to time, noting that there is no centrally managed clock. Chairs will provide short introduction of talks, provide a 1 minute-to-go warning, invite and moderate questions and getting the next speaker set up. Make sure you unmute before speaking. If background noise is coming through, Chairs should ask the audience to make sure they are muted and with cameras off. Chairs should be present from 5-10 minutes before the session to meet the session assistant and speakers. If it looks like there will more than 100 audience members, the chair/assistant should check with the organisers about whether to move that session to Teams. In the event that a speaker is absent, a gap should be left in the session so that the following talks start at the times stated in the programme.

Instructions for presenters in oral sessions

Prepare and practice the presentation so it fits in the time available. Check that you can share your screen and that any videos play properly while presenting, bearing in mind bandwidth limitations. Presenters should be at the front of the room from 5-10 minutes before the session to meet the session chair and assistant. Make sure you unmute before speaking. It is usually a better experience for the audience if speaker cameras are **on** for oral presentations, unless you get warnings about bandwidth issues. When you get the 1-minute warning move to your final slide and conclude. Presenters should remain in the room after the session to facilitate informal discussions.

Important note on invited (plenary) talks (35 minutes talks, 5 minutes questions)

In contrast to the parallel sessions, these will run as external calls from Gather.Town to Microsoft Teams. When you go to any of the lecture rooms A, B and C from 10 minutes before the start time, you will get the message 'Teams session in progress: **join by pressing 'x'**. Press 'x', follow the link and start MS Teams either in your own app, if you already have one, or else cancel the pop-up and select the option to join from your browser. Make sure your camera and microphone are off. You can then listen to the talk and post questions in the chat as in any normal Teams/Zoom meeting. At the end just close down your Teams window or tab and, back on the Gather tab of your browser, you will be able to click the green box to return to Gather.Town. The same method will be used for the initial welcome to the conference.

Instructions for poster sessions

Be ready with a short tour of your poster (1-2 minutes) when you get visitors to the private area. You have access to a pointer via Gather.Town to show items on the poster. You can also share a screen to show anything else (pptx, video etc.) If the area gets quiet for a while, try visiting your neighbours.

Instructions for sponsors

Try to be available during breaks, lunch hour etc. You can also share a screen to show anything else (pptx, video, websites, data sheets etc). You can also use the committee room for short presentations, which can be advertised in the chat.

Schedule overview

	Start	End	Lecture room A	Lecture room B	Lecture room C
Wed 8th Sept.	08:00	09:00	Site open (including help desk) for orientation and speaker checks		
	09:00	09:10	Welcome (access from any of the lecture rooms A, B or C)		
	09:15	10:15	1A: Bluff body wakes and plumes	1B: Geophysical flows 1	1C: Droplets 1
	10:30	11:30	2A: Aerodynamics & Roughness	2B: Geophysical flows 2	2C: Bubbles
	11:45	12:25	Invited talk I1: Aimee Morgans		
	13:15	13:55	Invited talk I2: Stephen Belcher		
	14:15	15:15	3A: Aerodynamics 1	3B: Biological flows 1	3C: Multiphase flows 1
	15:30	16:30	4A: Aerodynamics & turbulence	4B: Biological flows 2	4C: Porous media and surfactants
	17:00	19:00	Poster reception (Poster rooms A and B)		
Thursday 9th Sept.	09:00	09:40	Poster breakfast (Poster rooms A and B)		
	09:45	10:45	5A: High speed 1	5B: Data-driven modelling	5C: Thin film and interfacial flows
	11:00	12:00	6A: Aerodynamics and stratified flows	6B: Data /MHD	6C: Multiphase flows 2
	12:15	12:55	Invited talk I3: Emmanuel de Langre		
	13:45	14:45	7A: Aerodynamics/boundary layers	7B: Fluid-structure interactions	7C: Meshless/mesh-free methods for fluids
	15:00	16:00	8A: High speed 2	8B: Industrial flows	8C: Capillary flows/microfluids
	16:15	17:15	9A: Boundary layers	9B: Industrial and biological flows	9C: Porous media/microfluids
Friday 10th Sept.	09:00	10:00	10A: Aerodynamics 2	10B: Geophysical flows 3	10C: Droplets 2
	10:15	11:15	11A: Jets, wakes & turbulence	11B: Astrophysical flows	11C: Droplets 3
	11:30	12:30	12A: Aerodynamics 3	12B: Industrial flows	12C: Multiphase flows 3
	13:30	14:10	Invited talk I4: Rob Poole		
	14:15	14:30	Prizes		

Invited talks

I1 Sound, flames and aerodynamics: how they interact to generate thermoacoustic instability

Aimee Morgans, Imperial College

I2 Fluid mechanics for weather and climate research and operations

Stephen Belcher, Met Office

I3 Fluid-structure interaction with plants

Emmanuel de Langre, Ladhyx, Ecole Polytechnique

I4 Flow instabilities in the cross slot geometry: characterisation, exploitation and cure

Rob Poole, University of Liverpool

Parallel sessions 1: Wed 8th Sept 9:15-10:15

Session 1A Bluff body flows, wakes and plumes (Chair: Vanderwel)

9:15 (01A-1) Near-wake flow features of polygonal cylinders in different incidence angles, Esmaeel Masoudi, University of Durham

9:27 (01A-2) Attenuation of the unsteady loading on a high-rise building for different wind angles using feedback control, Xiao Hu, Imperial College London

9:39 (01A-3) Simulation of high Reynolds number sub-critical flow over a cylinder using a scale resolving hybrid RANS/LES closure model, Michael Mays, Imperial College London

9:51 (01A-4) Experimental modelling a buoyant pollutant source behind a backwards-facing step, Samuel Charlwood, University of Cambridge

10:03 (01A-5) The dynamics of a line plume confined by a single inclined boundary, Tom Newton, University of Cambridge

Session 1B Geophysical flows 1 (Chair: Tobias)

9:15 (01B-1) Channelized flow in the partially molten upper mantle, David W Rees Jones, University of St Andrews

9:27 (01B-2) Poroviscoelastic dynamics of mushy magmatic systems, Jennifer Castelino, University of Leeds

9:39 (01B-3) Investigation into the folding of layered viscous structures, Olivia Goulden, University of Leeds

9:51 (01B-4) Bounds for internally heated convection with fixed boundary heat flux, Ali Arslan, Imperial College London

10:03 (01B-5) Massively parallel Lattice Boltzmann Method models of dilute gravity currents, Damilola Adekanye, University of Leeds

Session 1C Droplets 1 (Chair: Peters)

9:15 (01C-1) Rim breakup dynamics in aerodynamic droplet breakup, Isaac M. Jackiw, University of Toronto

9:27 (01C-2) Atomisation of a capillary jet using a stacked-type electrofluidic actuator, Samy Lalloz, University of Coventry and CNRS

9:39 (01C-3) Numerical modelling of personal care products' spray efficiency, Liam Robert Gray, University of Leeds

9:51 (01C-4) Mathematical modelling and analysis of the evolution of and deposition from a sessile evaporating droplet, Hannah-May D'Ambrosio, University of Strathclyde

10:03 (01C-5) Governing equations and solution multiplicities for a static ridge of nematic liquid crystal, Joseph R. L. Cousins, University of Glasgow

Parallel sessions 2: Wed 8th Sept 10:30-11:30

Session 2A Aerodynamics & Roughness (Chair: Vanderwel)

10:30 (02A-1) Immersed boundary simulations on the effect of roughness: Flow over a flat plate, Jonathan Massey, University of Southampton

10:42 (02A-2) Effects of surface roughness in flapping foil performance, R. Vilumbrales Garcia, University of Southampton

10:54 (02A-3) Designing optimal roughness: A theory-led approach to roughness-based drag reduction, P.Y.A.G.S. Yapa, University of Warwick

11:06 (02A-4) Using flow control to create ideal platooning conditions for road vehicles, Craig Nolan, University of Glasgow

11:18 (02A-5) New insight into the increased turbulence due to non-uniform streamwise body forces in pipe flow, Stephen Jackson, University of Sheffield

Session 2B Geophysical flows 2 (Chair: Tobias)

10:30 (02B-1) A new Lagrangian drift mechanism in coastal oceans: role of current and seabed undulation interactions, Akanksha Gupta, University of Dundee

10:42 (02B-2) Internal wave triads in a bounded domain with mild-slope bathymetry, Saranraj Gururaj, University of Dundee

10:54 (02B-3) The interplay of symmetric, inertial, and baroclinic instabilities on the evolution of oceanic fronts, Aaron Wienkers, University of Cambridge

11:06 (02B-4) The effect of unbalanced exchange flow on the night cooling of buildings, Nick Wise, University of Cambridge

11:18 (02B-5) Validity of sound-proof approximations for magnetic buoyancy, John Moss, Newcastle University

Session 2C Bubbles (Chair: Peters)

10:30 (02C-1) Shape mode oscillation of a bubble in a viscous compressible liquid near to a rigid boundary, Callan Corbett, University of Birmingham

10:42 (02C-2) The effects of a Maxwell fluid on the evolution of a three-dimensional microbubble, Eoin O'Brien, University of Birmingham

10:54 (02C-3) Toroidal analysis of an oscillating sessile drop, Saksham Sharma, University of Cambridge

11:06 (02C-4) Influence of particle aggregation on evaporating and de-wetting droplets of complex fluids, Junzhe (James) Zhang, Loughborough University

11:18 (02C-5) Circular hydraulic jump in microgravity, Rajesh K. Bhagat, University of Cambridge

Parallel sessions 3: Wed 8th Sept 14:15-15:15

Session 3A Aerodynamics 1 (Chair: Lasagna)

14:15 (03A-1) Validation of analytical wind turbine wake models in turbulent base flows, Stefano Gambuzza, University of Southampton

14:27 (03A-2) Investigation of the validity of wall-modelling in simulations of rotating cavity flows, Tom Hickling, University of Oxford

14:39 (03A-3) Adaptive reduced order modelling of steady aerodynamic flows over ultra-high aspect ratio wings, Peter Nagy, University of Strathclyde

14:51 (03A-4) Modulation of leading-edge vortex whedding with chordwise deformation, Alfonso Martínez, University of Glasgow

15:03 (03A-5) Effect of thickness on wake dynamics of an airfoil pitching in uniform flow, Muhammed Najvan, IIT Kanpur

Session 3B Biological flows 1 (Chair: Weymouth)

14:15 (03B-1) On the coupling between back pressure and flow structure in airway bifurcations, Solène Cargill, Coventry University

14:27 (03B-2) 4D-Flow MRI based CFD to improve patient specific in-silico predictions of the post-surgical haemodynamics in the thoracic aorta, Molly Cherry, University of Leeds

14:39 (03B-3) Non-trivial transport of active Brownian particles (micro-swimmers) in shear, Lloyd Fung, Imperial College London

14:51 (03B-4) Is the shape of air particulate matter important? A study on the interactions of the two shapes of titanium dioxide nanoparticles with a model of pulmonary surfactant, Farzaneh Hajirasouliha, Northumbria University

15:03 (03B-5) Optimal turning gaits for undulators, Madeleine Hall, Imperial College London

Session 3C Multiphase flows 1 (Chair: Lawson)

14:15 (03C-1) Flow correlations and transport behaviour of turbulent slurries in a partially filled pipe, Christopher J. Cunliffe, University of Liverpool

14:27 (03C-2) A population balance approach for investigating the condensation of aluminum oxide droplets near a burning aluminum particle, Jannis Finke, University of Magdeburg

14:39 (03C-3) CFD simulation of particles-liquid turbulent pipe flow, Zhuangjian Yang, University of Birmingham

14:51 (03C-4) Improving multi phase measurement performance of a Coriolis Flowmeter with additional pressure drop correlations, Stephan Schäfer, University of Glasgow

15:03 (03C-5) Swelling driven autonomous soft gripper, Zhuofan Qin, Northumbria University

Parallel sessions 4: Wed 8th Sept 15:30-16:30

Session 4A Aerodynamics & turbulence (Chair: Lasagna)

15:30 (04A-1) New optimisation methods for scale-resolving turbulent flow simulation, Rhys Gilbert, University of Southampton

15:42 (04A-2) Optical MEMS sensors for wall-shear stress measurements in turbulent boundary layer flows, Nima Ebrahimzade, Newcastle University

15:54 (04A-3) The mechanism of lobes generation in the sound directivity patterns for gust-airfoil interaction, Shujie Jiang, University of Southampton

16:06 (04A-4) The turbulence production mechanism in the near-wall region under an adverse pressure gradient, Yuxin Jiao, Imperial College London

16:18 (04A-5) Dipole dynamics in the Point Vortex Model, Karl Lydon, Aston University

Session 4B Biological flows 2 (Chair: Weymouth)

15:30 (04B-1) Mathematical modelling of drug metabolism in a microfluidic system, Barnum Swannell, University of Oxford

15:42 (04B-2) A poroelastic model for loading induced damage and rehabilitation in tendons, Isabelle Scott, University Of Oxford

15:54 (04B-3) Reconstruction and segmentation of noisy flow images as an inverse Navier-Stokes problem, Alexandros Kontogiannis, University of Cambridge

16:06 (04B-4) Multi-objective optimisation of continuous flow polymerase chain reaction flow systems, Foteini Zagklavara, University of Leeds

Session 4C Porous media and surfactants (Chair: Peters)

15:30 (04C-1) Deformation-driven rupture of gas cavities within a soft porous medium, Oliver Paulin, University of Oxford

15:42 (04C-2) Using Dissipative Particle Dynamics for investigating surfactant solutions under shearing, Rachel Hendrikse, University of Leeds

15:54 (04C-3) Singularities in surfactant driven cavity flow, Richard Mcnair, University of Manchester

16:06 (04C-4) Hydrodynamic interactions of sedimenting squirmers, Albane Théry, University of Cambridge

Parallel sessions 5: Thur 9th Sept 9:45-10:45

Session 5A High speed 1 (Chair: Deiterding)

9:45 (05A-1) Influence of thermodynamic model on the shock interaction patterns of CO2 flows, Catarina Garbacz, University of Strathclyde

9:57 (05A-2) The UK's hypersonic multiphysics fluid simulation suite: OP2A, Thomas Greenslade, University of Southampton

10:09 (05A-3) Effect of rarefaction on the evolution of compressible Kelvin-Helmholtz instability, Vishnu Mohan, IIT Madras

10:21 (05A-4) Analysis of grid influence on the simulation of nonequilibrium flow over proximal bodies, Fábio Morgado, University of Strathclyde

10:33 (05A-5) Simulations of rotating detonation waves with adaptive mesh refinement, Han Peng, University of Southampton

Session 5B Data-driven modelling (Chair: Juniper)

9:45 (05B-1) Reconstruction of 3D large-scale structures inside a stirred tank from limited velocity measurements, Kirill Mikhaylov, Imperial College London

9:57 (05B-2) A minimal data-driven quasilinear approximation based approach for turbulent channel flow statistics, Jacob Holford, Imperial College London

10:09 (05B-3) CNN-aided flooding prognostic in packed column using Electrical Capacitance Tomography, Yuan Chen, University of Edinburgh

10:21 (05B-4) Ensemble simulation methods for in-silico trials of endovascular medical devices, Michael MacRaild, University of Leeds

10:33 (05B-5) Poisson CNN: Convolutional neural networks for the solution of the Poisson equation on a Cartesian mesh, Ali Girayhan Özbay, Imperial College London

Session 5C Thin film and interfacial flows (Chair: Hazel)

9:45 (05C-1) Experimental investigation of displacement instabilities in straight microchannels with pure viscoelastic fluids, Seng H. Hue, UCL

9:57 (05C-2) Reversible trapping of colloids in continuous flows past grooved microchannels by diffusiophoresis, Naval Singh, Loughborough University

10:09 (05C-3) Coating flow in the presence of an irrotational airflow with circulation, Andrew Mitchell, University of Strathclyde

10:21 (05C-4) Wetting and dewetting dynamics of a thin liquid film spreading on an immiscible liquid surface, Christophe J. Wilk, University of Manchester

10:33 (05C-5) Adjoint equation-based estimation of porous media permeability, Tao Zhang, University of Bath

Parallel sessions 6: Thur 9th Sept 11:00-12:00

Session 6A Aerodynamics and stratified flows (Chair: Deiterding)

11:00 (06A-1) The effect of large scale incoming turbulence on wind-turbine-blade, ThankGod E. Boye, University of Southampton

11:12 (06A-2) An experimental investigation of the flow past a very thick flatback airfoil suitable for wind turbine blades, Antonios Cene, Swansea University

11:24 (06A-3) Harmonic forcing of a laminar bluff body wake with rear pitching flaps, Athanasios E. Giannenas, Imperial College London

11:36 (06A-4) Fluid mechanics of sash windows, Gaël Kemp, University of Cambridge

11:48 (06A-5) A comparison of the development of spatially and temporally accelerating flows, Matthew Falcone, University of sheffield

Session 6B Data /MHD (Chair: Juniper)

11:00 (06B-1) Spectral Relaxation computation of heat transfer in aligned-field MHD Flow of nanofluid over a moving flat plate, Shahina Akter, University of Dhaka

11:12 (06B-2) Electrically driven Alfven Wave investigation, Samy Lalloz, University of Coventry and CNRS

11:24 (06B-3) Is machine learning robust for the prediction of chaotic flows? A. Racca, University of Cambridge (to be presented by Luca Magri)

11:36 (06B-4) Koopman with control for constitutive law identification, Emily Southern, Imperial College London

Session 6C Multiphase flows 2 (Chair: Hazel)

11:00 (06C-1) An Eulerian-Lagrangian approach to simulate particle-laden flows, Boyang Chen, University of Birmingham

11:12 (06C-2) Combining the method of characteristics with a reduced order modeling technique for economically solving the population balance equation, Fabian Sewerin, University of Magdeburg

11:24 (06C-3) A numerical study on suspended sediment transport in a partially vegetated channel flow, Mingyang Wang, Queen Mary University of London

11:36 (06C-4) A deep learning-CFD method for Reynolds-Averaged Navier-Stokes simulations of arterial flows, Konstantinos Lyras, King's College London

11:48 (06C-5) A family of non-monotonic toral mixing maps, Joe Myers Hill, University of Leeds

Parallel sessions 7: Thur 9th Sept 13:45-14:45

Session 7A Aerodynamics/boundary layers (Chair: Sandham)

13:45 (07A-1) Transpiration cooling of hypersonic flow past a flat plate with porous injection, Pushpender K. Sharma, University of Southampton

13:57 (07A-2) Direct numerical solution of compressible flow over rough surfaces, Raynold Tan, University of Southampton

14:09 (07A-3) Design and characterisation of a gust generator for aeroelastic wind tunnel testing, Davide Balatti, Swansea University

14:21 (07A-4) Travelling waves in the asymptotic suction boundary layer, Matthias Engel, University of Edinburgh

14:33 (07A-5) Comparison of Lagrangian curvature und torsion statistics in open and wall-bounded turbulent flows, Yasmin Hengster, University of Edinburgh

Session 7B Fluid-structure interactions (Chair: He)

13:45 (07B-1) Spatiotemporal dynamics of a vortex induced vibration system in presence of noise, M. S. Aswathy, IIT Madras

13:57 (07B-2) Numerical investigation of fluid-structure interaction of a surface mounted elastic plate in a cross flow, Meltem Cakir, Loughborough University

14:09 (07B-3) Energy harvesting potential of an Unimorph Flexible Beam in Uniform Flow, Rajanya Chatterjee, IIT Madras

14:21 (07B-4) Numerical investigation of pressure spaces in solving fluid-structure interactions using an ALE finite element method, Gregory Walton, University of Leeds

14:33 (07B-5) Computational study of vibration-based leak detection approach in 90-degree pipe elbow, Ahmed Abuhatira, University of Dundee

Session 7C Meshless/mesh-free methods for fluids (Chair: Rogers)

13:45 (07C-1) A pseudo-spectral high-order methodology for incompressible smoothed particle hydrodynamics, Georgios Fourtakas, University of Manchester

13:57 (07C-2) High Weissenberg number simulations with incompressible Smoothed Particle Hydrodynamics and the log-conformation formulation, Jack King, University of Manchester

14:09 (07C-3) High-order simulations using the Local Anisotropic Basis Function Method, Jack King, University of Manchester

14:21 (07C-4) Dealing with density discontinuities in planetary SPH simulations, S. Ruiz-Bonilla, Durham University

Parallel sessions 8: Thur 9th Sept 15:00-16:00

Session 8A High speed 2 (Chair: Sandham)

15:00 (08A-1) Effect of flow parameters on transonic buffet at moderate Reynolds numbers, Pradeep Moise, University of Southampton

15:12 (08A-2) Effect of boundary layer transition on shock buffet instability, Wei He, University of Liverpool

15:24 (08A-3) Numerical and experimental analysis of transonic buffet for different airfoil geometries at moderate Reynolds numbers, Markus Zauner, ONERA

15:36 (08A-4) Practical resolvent analysis applied to shock buffet on the common research model elastic wing, Jelle Houtman, University of Liverpool

15:48 (08A-5) Shock train response to back pressure forcing, Alex Gillespie, University of Southampton

Session 8B Industrial flows (Chair: He)

15:00 (08B-1) Indirect noise in multi-component nozzle flows with dissipation, Animesh Jain, University of Cambridge

15:12 (08B-2) Data assimilation of thermoacoustics, Andrea Nóvoa, University of Cambridge

15:24 (08B-3) Diffusiophoresis: a mechanism to produce small-on-top stratified coatings, Clare R. Rees-Zimmerman, University of Cambridge

15:36 (08B-4) Optimising anaerobic baffled reactors performance through combined numerical and experimental analysis, Riza Inanda Siregar, University of Birmingham

15:48 (08B-5) Energy-saving transportation of liquid in a Bend Tube: an endo-anodizing approach, Honghao Zhou, Northumbria University

Session 8C Capillary flows/microfluids (Chair: Sykes)

15:00 (08C-1) Detachment of a tilting plate suspended by a capillary bridge, Matthew Butler, University of Birmingham

15:12 (08C-2) Capillary-scale solid rebounds: experiments, modelling and simulations, Carlos A. Galeano-Rios, University of Birmingham

15:24 (08C-3) Substrate curvature affects droplet splashing, Thomas C. Sykes, University of Oxford

15:36 (08C-4) Bifurcations and control of bubbles in Hele-Shaw cells, Alice Thompson, University of Manchester

15:48 (08C-5) Colloidal particle focusing and sorting in microchannels via solute concentration gradients, Adnan Chakra, Loughborough University

Parallel sessions 9: Thur 9th Sept 16:15-17:15

Session 9A Boundary layers (Chair: Krishna)

16:15 (09A-1) Analysis of wall mass transfer in a turbulent pipe flow using extended proper orthogonal decomposition, Rasmus Korslund Schlander, Imperial College London

16:27 (09A-2) On the effects of in-plane solidity on the different regimes of canopy flows, S. Nicholas, City University

16:39 (09A-3) Linearised predictions of secondary currents in turbulent channels with topographical heterogeneity, Gerardo Zampino, University of Southampton

16:51 (09A-4) Heat transfer in next generation Gyroid Heat Exchangers, I. Qureshi, University of Leeds

17:03 (09A-5) To tread or not to tread? Swathi Krishna, EPFL

Session 9B Industrial and biological flows (Chair: He)

16:15 (09B-1) Redistribution of a passive tracer in a porous substrate under a surface washing flow at high Péclet number, Emily Butler, University of Manchester

16:27 (09B-2) Optimising tool channel design to improve coolant distribution and reduce cutting temperatures in machining processes, Eleanor Harvey, University of Leeds

16:39 (09B-3) Collective dynamics of active filaments on spherical surfaces, Timothy A. Westwood, Imperial College London

16:51 (09B-4) Shape, shear and diffusion effects on bacterial orientation distributions near walls, Smitha Maretvadakethope, University of Liverpool

17:03 (09B-5) Combined effects of wall transpiration and plate movement on self-similar biomagnetic flow, Sadia Anjum Jumana, University of Dhaka

Session 9C Porous media/microfluids (Chair: Sykes)

16:15 (09C-1) Scalar and momentum transport across patches of cylinders, D.D. Wangsawijaya, University of Southampton

16:27 (09C-2) Cell-scale haemodynamics and transport in canonical disordered porous media: microfluidic experiments and theoretical models, Kerstin Schirrmann, University of Cambridge

16:39 (09C-3) Pore-scale large-eddy simulations of turbulent flow in a composite porous-fluid system, Mohammad Jadidi, University of Manchester

16:51 (09C-4) Shock-induced collapse of cavitating surface nanobubbles, Duncan Dockar, University of Edinburgh

17:03 (09C-5) Dynamics of interfacial peeling, Sepideh Khodaparast, University of Leeds

Parallel sessions 10: Fri 10th Sept 9:00-10:00

Session 10A Aerodynamics 2 (Chair: Papadakis)

9:00 (10A-1) Hydrodynamics of flow over a flat plate with generic roughness elements, Melike Kurt, University of Southampton

9:12 (10A-2) Eigenmode decomposition as a foundation for exploring high-efficiency swimming, Amanda Smyth, University of Oxford

9:24 (10A-3) Recirculation regions in wakes with base bleed, Konstantinos Steiros, Imperial College London

9:36 (10A-4) PIV and LES investigation of the flow around a succulent-inspired cylinder, Oleksandr Zhdanov, University of Glasgow

9:48 (10A-5) Turbulent entrainment in large wind farms, N. Bempedelis, Imperial College London

Session 10B Geophysical flows 3 (Chair: Busse)

9:00 (10B-1) PIV investigation of flow inside a rotating tangent cylinder, Rishav Agrawal, Coventry University

9:12 (10B-2) Volcanic plumbing systems and the dynamics of magma ascent, Caitlin Chalk, University of Liverpool

9:24 (10B-3) Bubble curtains used as barriers across horizontal density stratifications, Daria Frank, University of Cambridge

9:36 (10B-4) Quasi-static magneto-hydrodynamic convection in a rotating cylinder, Anthony Rouquier, Coventry University

Session 10C Droplets 2 (Chair: McHale)

9:00 (10C-1) Evaporation of sessile droplets on slippery liquid-like surfaces and slippery liquid-infused porous surfaces (SLIPS), Steven Armstrong, University of Edinburgh

9:12 (10C-2) Kinetics of breath figure templating on photocurable polymer substrates, Francis Dent, University of Leeds

9:24 (10C-3) Dielectrowetting of low dielectric films in high dielectric liquids, Andrew M. J. Edwards, Nottingham Trent University

9:36 (10C-4) Multifaceted design optimization for superomniphobic surfaces, Halim Kusumaatmaja, Durham University

9:48 (10C-5) Droplet wetting and self-propulsion on liquid surfaces, Glen McHale, University of Edinburgh

Parallel sessions 11: Fri 10th Sept 10:15-11:15

Session 11A Jets, wakes & turbulence (Chair: Papadakis)

10:15 (11A-1) Effects of porosity on the flow structure in the outer region of turbulent boundary layers, Prateek Jaiswal, University of Southampton

10:27 (11A-2) Vortical structures of stratified shear layers in an inclined duct, Xianyang Jiang, University of Cambridge

10:39 (11A-3) Experimental study of vortex ring impingement: three-dimensional flow field, wall shear stress and heat transfer, Qianhui Li, City University

10:51 (11A-4) Experimental properties of continuously-forced, shear-driven, stratified turbulence, Adrien Lefauve, University of Cambridge

11:03 (11A-5) Generalised Quasilinear approximation of a two-dimensional Kolmogorov flow exhibiting spatially localised turbulent states, Hannah Kreczak, Newcastle University

Session 11B Astrophysical flows (Chair: Busse)

10:15 (11B-1) Shear driven magneto-buoyancy under the influence of rotation, Craig Duguid, Newcastle University

10:27 (11B-2) A new residual distribution solver for galaxy formation simulations, Ben Morton, University of Edinburgh

10:39 (11B-3) Diffusion and dispersion in anisotropic magnetohydrodynamic turbulence, Jane Pratt, Georgia State University

10:51 (11B-4) Magnetic layering in the solar radiative zone, Fryderyk Wilczynski, University of Leeds

11:03 (11B-5) Non-linear simulations of tidal flows in an adiabatic convective shell, Aurélie Astoul, University of Leeds

Session 11C Droplets 3 (Chair: Kusumaatmaja)

10:15 (11C-1) Controlling the breakup of toroidal liquid films on solid surfaces, Glen McHale, University of Edinburgh

10:27 (11C-2) Dynamics of respiratory saliva droplets, Avshalom Offner, The University of Edinburgh

10:39 (11C-3) Robust interpolation schemes for dispersed particle flows using the Full Lagrangian Approach, Chris Stafford, University of Brighton

10:51 (11C-4) Nanobubble nucleation from acoustothermal physics, Saikat Datta, University of Edinburgh

Parallel sessions 12: Fri 10th Sept 11:30-12:30

Session 12A Aerodynamics 3 (Chair: Papadakis)

11:30 (12A-1) Efficacy of turbulence modeling techniques in capturing dynamic stall at low Reynolds numbers, Chandan Bose, University of Liège

11:42 (12A-2) Far-field acoustic investigation surrounding a separated aerofoil using time-resolved PIV, Douglas W. Carter, University of Southampton

11:54 (12A-3) Modelling rough and porous media with an adaptive mesh refinement Lattice Boltzmann Method, Mikaël Grondeau, University of Southampton

12:06 (12A-4) Effects of fractal-like multiscale roughness on turbulent boundary layers, T.Medjnoun, University of Southampton

Session 12B Industrial flows (Chair: Busse)

11:30 (12B-1) A combustion instability mechanism in rocket engines produced by orifice whistlin, Philipp Brokof, Imperial College London

11:42 (12B-2) Particle image velocimetry of a jet impacting a tightly packed tube bundle, Thomas Charpentier, Polytechnique Montréal

11:54 (12B-3) Stability, receptivity and sensitivity of mixed baroclinic convection in a cavity, Abhishek Kumar, Coventry University

Session 12C Multiphase flows 3 (Chair: McHale)

11:30 (12C-1) Mass transfer from small spheroids suspended in a turbulent fluid, J. M. Lawson, University of Southampton

11:42 (12C-2) A phase-field model for capillary bulldozing, Liam Morrow, University of Oxford

11:54 (12C-3) Boiling flow dynamics in non-isothermal microchannels with conjugate heat transfer, Federico Municchi, University of Nottingham

Poster presentations A

PA01 Towards optimization of a wave-to-wire energy device in a breakwater contraction, Jonathan Bolton, University of Leeds

PA02 Withdrawn

PA03 A Bayes factor comparison of the Brownian and Langevin models of passive particle transport, Martin Brolly, University of Edinburgh

PA04 Predicting the statistics of chaotic systems using resolvent based modelling, Thomas Burton, University of Southampton

PA05 Real-time parameter inference in reduced-order flame models with heteroscedastic Bayesian neural network ensembles, Maximilian L. Croci, University of Cambridge

PA06 Turbulent flow field reconstruction from sparse measurements, Francis De Voogt, University of Southampton

PA07 DNS of incompressible Rayleigh--Taylor instabilities at low and medium Atwood numbers, Arash Hamzehloo, Imperial College London

PA08 Withdrawn

PA09 Do ambient shear and thermal stratification impact wind turbine wake breakdown? Amy Hodgkin, Imperial College London

PA10 Simulating atmospheric boundary layer flow in a recirculating water tunnel, Desmond Lim, University of Southampton

PA11 Simulating surface wave dynamics with Convolutional Neural Networks, Mario Lino, Imperial College London

PA12 Machine learning modelling of transonic aerodynamic loads for aeroelastic analysis of an airfoil, David Massegur, University of Southampton

PA13 Turbulent channel flow over streamwise-aligned ribs, Mattias Nilsson, University of Southampton

PA14 Swirling vortex rings, Rigoberto Ortega-Chavez, Durham University

PA15 Sensitivity analysis of flood prediction model performance, Saba Rabab, Heriot-Watt University

PA16 Recurrent Neural Network based surrogate modeling of unsteady forces acting on a plunging airfoil, Rahul Sundar, IIT Madras

PA17 Unsteady flow development in particulate filter channels due to oblique flow entry, Callum Samuels, Coventry University

PA18 Scale-space energy transfer pathways in inhomogeneous compressible turbulence, S. Arun, Imperial College London

PA19 Weakly nonlinear theory for deterministic wave forecasting, Raphael Stuhlmeier, University of Plymouth

PA20 Three-dimensional modification of Gurney flap to improve the lift-type vertical axis wind turbine performance, Taurista P. Syawitri, University of The West of England

PA21 Data assimilation for RANS using time-averaged PIV of the flow around a NACA0012 airfoil, Craig Thompson, University of Southampton

PA22 Simulation of turbulent axisymmetric bluff body wake with the effect of pulsed jet forcing, Taihanh Zhu, Imperial College London

PA23 Modelling airway mucus: Rayleigh-Plateau instability of an annular viscoplastic liquid film, James Shemilt, University of Manchester

PA24 Left ventricular remodelling: Integrating flow imaging and machine learning into patient-specific models, Fergus Shone, University of Leeds

Poster presentations B

PB01 Simulation of behavioural modification effects in multiphase flows, Jacob Anderson, University of Leeds

PB02 Cavity collapse near porous plates, Elijah Andrews, University of Southampton

PB03 Two-phase flow in the dynamic Earth: Reactive-infiltration instabilities, Danielle Bullamore, University of Leeds

PB04 Generation of bubbles by spilling breaking wave groups, Konstantinos Chasapis, UCL

PB05 A robust microfluidic device for fabricating deformable microcapsules based on water-oil-water double-emulsion templates, Qi Chen, University of Manchester

PB06 Surface-washing of contaminated porous substrates, Francesco P. Contò, University of Cambridge

PB07 Melt percolation in solid rocks: A numerical study of pattern formation in rock-melt mixtures, Giulia Fedrizzi, University of Leeds

PB08 Effects of shell thickness on cross-helicity generation in convection-driven spherical dynamos, Parag Gupta, University of Glasgow

PB09 Lateral stress effects on bubbles in Hele-Shaw channels, Jacob Harris, University of Manchester

PB10 Viscoelastic fluid flow in microporous media, Victor Ibezim, University of Liverpool

PB11 Fluid dynamics around freely falling ice-particle crystals: An experimental investigation using three-dimensional particle tracking velocimetry, M. H. Khan, University of Reading

PB12 Flexible sheets in turbulent flow, Marin Lauber, University of Southampton

PB13 Robotic inspection of pre-filled medical syringes, Hamza Liaquet, University of Leeds

PB14 A finite volume coupled level set and volume of fluid method with a mass conservation step for simulating two-phase flows, Konstantinos Lyras, King's College London

PB15 Particle patterning inside glass capillary tubes using thin film surface acoustic wave devices, Sadaf Maramizonouz, Northumbria University

PB16 The creation of a photoelastic force balance, Bradley McLaughlin, University of Southampton

PB17 Inactivation effect of human thermal plume and upper-room ultraviolet air disinfection on the COVID-19 transmission, Shuo Mi, Queen Mary University of London

PB18 Asymptotic framework for flood models comparison, Piotr Morawiecki, University of Bath

PB19 African Easterly Wave precursors to tropical cyclogenesis in a convection-permitting model, Fran Morris, University of Leeds

PB20 Withdrawn

PB21 Pattern formation in polymer droplets spreading on a smooth substrate, Ahmed Othman, University of Cambridge

PB22 Jet tilt and the understanding of North Atlantic jet variability and regimes, Jacob Perez, University of Leeds

PB23 Withdrawn

PB24 Cusps-filaments at receding viscoelastic contact line, Saksham Sharma, University of Cambridge