

17th Multiphase Flow Conference and Short Course:
Simulation, Experiment and Application
Dresden, 11 - 15 November 2019

Monday, 11 November 2019				
Short Course on Multiphase Flows				
Time		Lecturer	Affiliation	Title
12:30	13:30	Registration		
13:30	13:50	D. Lucas	Helmholtz-Zentrum Dresden-Rossendorf, Germany	Welcome & General Information
13:50	14:50	G. Scheuerer	ISimQ GmbH, Warngau, Germany	Mathematical Models for Multiphase Flows: Overview & Basic Equations
14:50	15:10	Break with Coffee, Tea & Beverages		
15:10	16:10	T. Esch	ANSYS Germany, Otterfing	Lagrangian Two-Phase Flow Modelling
16:10	16:30	Break with Coffee, Tea & Beverages		
16:30	17:30	U. Hampel	Helmholtz-Zentrum Dresden-Rossendorf, Germany	Measurement Techniques and Experimental Investigations for Multiphase Flows
17:30	17:50	All	Discussion, Questions & Answers	
17:50		Transfer to Dresden		

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Tuesday, 12 November 2019				
Short Course on Multiphase Flows				
Time	Lecturer	Affiliation	Title	
08:30	09:00	Registration		
09:00	10:00	H. Eickenbusch	ANSYS Germany, Otterfing	Eulerian Multiphase Flow Modelling: Phase Interaction Models
10:00	10:20	Break with Coffee, Tea & Beverages		
10:20	11:20	M. Peric	Siemens Industry Software GmbH, Germany	Modelling of free-surface flows with focus on the VOF Method
11:20	11:40	Break with Coffee, Tea & Beverages		
11:40	13:00	R. Rzehak	Helmholtz-Zentrum Dresden-Rossendorf, Germany	Dispersed Flow Modelling - Multiple-Size Group Modelling - MUSIG
13:00	13:05	Group Photo		
13:05	14:05	Lunch		
14:05	15:05	M. Peric	Siemens Industry Software GmbH, Germany	Interfacial Heat and Mass Transfer Models
15:05	15:50	T. Höhne	Helmholtz-Zentrum Dresden-Rossendorf, Germany	Stratified & Segregated Flow Modelling - Interfacial Area Density Model - AIAD
15:50	16:10	Break with Coffee, Tea & Beverages		
16:10	16:55	D. Lucas	Helmholtz-Zentrum Dresden-Rossendorf, Germany	Multi-Scale Modelling Techniques - GENTOP
16:55	17:55	F. Schlegel / Ch. Greenshields	HZDR Germany / OpenFOAM foundation, UK	Flexible development framework for the Euler-Euler approach
17:55	18:15	All	Discussion, Questions & Answers	
18:15		Transfer to Dresden		
19:00		Short Course Dinner @ Restaurant "Schillergarten"		

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Wednesday, 13 November 2019				
Short Course on Multiphase Flows - Code Capabilities & Experimental (Parallel Sessions)				
Time	Lecturer	Affiliation	Title	
Code capabilities part				
Plenum				
09:00	09:35	M. Braun	ANSYS Germany	Multiphase Flow Capabilities in FLUENT /CFX
09:35	10:10	D. Mann	Siemens PLM, UK	Multiphase Flow Capabilities in STAR-CCM+
10:10	10:45	Ch. Greenshields	OpenFOAM foundation, UK	Multiphase Flow Capabilities in OpenFOAM
10:45	11:00	Break with Coffee, Tea & Beverages		
Parallel Sessions				
11:00	12:00	T. Esch	ANSYS Germany	FLUENT / CFX demonstration
11:00	12:00	C. Santarelli & F. Klippel	Siemens PLM, Germany	STAR-CCM+ demonstration
11:00	12:00	Ch. Greenshields	OpenFOAM Foundation	OpenFOAM demonstration
Experimental part				
09:00	12:00	E. Schleicher & A. Bieberle	Helmholtz-Zentrum Dresden-Rossendorf, Germany	Interactive Seminar on the Application of Two-Phase Flow Measuring Techniques - Wire-Mesh Sensors & Gamma CT
12:00	13:00	Lunch		

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12:30	13:00	Registration Conference		
Wednesday, 13 November 2019 - Multiphase Flow Conference - Session 1				
Chair:		T. Höhne	Helmholtz-Zentrum Dresden-Rossendorf	
Time		Presenter	Affiliation	Title
13:00	13:10	R. Sauerbrey	Helmholtz-Zentrum Dresden-Rossendorf	Welcome
13:10	13:35	J. Peltola	VTT Technical Research Centre of Finland Ltd	On non-drag interfacial force and thermal phase change modelling of reactingEulerFoam
13:35	14:00	Ch. Sam	Boehringer Ingelheim RCV GesmbH & Co KG	Application of Computational Fluid Dynamics (CFD) in biopharmaceutical industry: increasing scale-up insight and directing optimization
14:00	14:25	J. Schulz	Technische Universität Berlin	Transport processes and interfacial phenomena in disperse multiphase systems - An experimental single drop study
14:25	14:50	D. Papoulias	Siemens Industries software Computational Dynamics Ltd.	Population balance modelling of polydispersed bubbly flow in obstructed pipe
14:50	15:15	M. Olbrich	Physikalisch-Technische Bundesanstalt (PTB)	A machine learning approach to liquid level extraction from video observations in multiphase flow metrology
15:15	15:45	Coffee, Tea & Beverages		
Multiphase Flow Conference - Session 2				
Chair:		T. Esch	ANSYS Germany, Darmstadt	
Time		Presenter	Affiliation	Title
15:45	16:10	M. A. Taborda	Otto-von-Guericke-University Magdeburg	Modelling of bubble columns considering mass transfer, chemical reactions and effects of bubble dynamics in the frame of LES-Euler/Lagrange approach
16:10	16:35	H. Stel	Federal University of Technology, Curitiba, Brazil	Numerical and Experimental Study of Gas-Liquid Flows in a Centrifugal Rotor
16:35	17:00	K. Angele	Vattenfall AB, R&D Business Strategy, Sweden	A novel and simple rule-of-thumb for the onset of cavitation after orifice plates
17:00	18:30	Visit of the Experimental Facilities @ Institute of Fluid Dynamics		
18:30		Transfer to the hotels		

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Thursday, 14 November 2019				
Multiphase Flow Conference - Session 3				
Chair:		R. Rzehak	Helmholtz-Zentrum Dresden-Rossendorf	
Time		Presenter	Affiliation	Title
09:00	09:45	I. Bolotnov	North Carolina State University Raleigh, NC, USA	<u>Keynote:</u> DNS and Interface-capturing simulations of two-phase flows in complex geometries
09:45	10:10	J. Fröhlich	Institute of Fluid Mechanics, Technische Universität Dresden	Direct Numerical Simulation of sediment transport with non-spherical polydisperse particles
10:10	10:35	E. Trautner	Bundeswehr University Munich	A Direct Numerical Simulation analysis of coherent structures in bubble-laden channel flows
10:35	11:00	K. Singh	University of Nottingham, UK	A Computational Study on the Disintegration Mechanism of Liquid from a Rotary Disk Atomizer
11:00	11:30	Coffee, Tea & Beverages		
Multiphase Flow Conference - Session 4				
Chair:		U. Hampel	Helmholtz-Zentrum Dresden-Rossendorf	
Time		Presenter	Affiliation	Title
11:30	11:55	J. Schlottke	MAHLE Stuttgart	CFD simulation of multiphase flow in evaporators
11:55	12:20	N. Homma	Mitsubishi Electric R&D Centre Europe Livingston, UK	Multiphase Lattice Boltzmann Simulation of Self-propelling Droplet on Wettability Gradient Surface
12:20	12:45	M. Haustein	TU Bergakademie Freiberg	Optical Investigation of Segregation Processes in dense Suspensions
12:45	12:50	Group Photo		

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12:50	13:45	Lunch		
Multiphase Flow Conference - Session 5				
Chair:		G. Scheuerer	ISimQ GmbH	
Time		Presenter	Affiliation	Title
13:45	14:10	X. Yang	CoC Fluid Dynamics, Bosch Rexroth	Efficient one-way simulation of bubble dispersion and resulted interaction
14:10	14:35	T. Wacławczyk	Warsaw University of Technology, Poland	Modeling of non-equilibrium effects in intermittency region between immiscible phases
14:35	15:00	G. Montoya	ANSYS, Inc. Lebanon, USA	On the implementation and validation of the Algebraic Interfacial Area Density (AIAD) model in the CFD code FLUENT
15:00	16:30	Poster Session with Coffee, Tea & Beverages - Votes for the Best Poster Award - see Poster list		
Multiphase Flow Conference - Session 6				
Chair:		Y. Liao	Helmholtz-Zentrum Dresden-Rossendorf	
16:30	16:55	D. Kreitmeier	Ruprecht-Karls-Universität Heidelberg	Simulation of the fluid dynamic characteristics of a stirred tank bioreactor
16:55	17:20	S. C. Ozan	Norwegian University of Science and Technology, Norway	Coalescence: from film drainage models to population balance framework
17:20	17:45	A. Mühlbauer	Technische Universität Kaiserslautern	Modeling solid-particle effects in slurry bubble columns
17:45	18:10	P. Fuchs	Ruhr Universität Bochum	Preliminary results of water hammer simulation in two-phase flow regimes using different OpenFOAM packages
18:15		Transfer to the Restaurant "Pulverturm"		
19:00	21:30	Conference Dinner @ Restaurant "Pulverturm"		

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Friday, 15 November 2019				
Multiphase Flow Conference - Session 7				
Chair:		D. Lucas	Helmholtz-Zentrum Dresden-Rossendorf	
Time		Presenter	Affiliation	Title
09:00	09:45	H.-M. Prasser	ETH Zürich, Switzerland	<u>Keynote:</u> Measurements in Dynamic Liquid Films
09:45	10:10	J. Lefers	Forschungszentrum Jülich GmbH	Experimental Investigation and Evaluation of Multiphaseflow Reactors for Power-to-Fuel Processes
10:10	10:35	J. E. Olsen	SINTEF Norway	Pros & cons of the coupled DPM and VOF models in bubbly flow modelling
10:35	11:05	Coffee, Tea & Beverages		
Multiphase Flow Conference - Session 8				
Chair:		M. Braun	ANSYS Germany, Darmstadt	
Time		Presenter	Affiliation	Title
11:05	11:30	M. Sayed	Paul Scherrer Institut Switzerland	On the Prediction of Turbulent Kinetic Energy in Turbulent Channel Flows Using Wall-modeled Large Eddy Simulations
11:30	11:55	L. Vyskocil	UJV Rez a. s., Czech Republic	CFD Simulation of the Departure from Nucleate Boiling in Pipes
11:55	12:20	V. Gall	Karlsruhe Institute of Technology	Investigation of cavitation patterns in high-pressure homogenization nozzles using shadow-graphic images
12:20	12:30	Closure		
12:30	13:00	Snacks & Beverages		
13:00		Transfer to Hotels (Main train station) or Airport		

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Poster - Best poster will be selected by the participants		
Abdullahi, M.	Kaduna Polytechnic, Nigeria	Experimental measurements of gas entrainment rates in gas-liquid two-phase slug flows in horizontal and slightly inclined pipes
Ahmed, I.	University of Leeds, UK	Development of Unified Taylor Bubble Drift Velocity Correlation Using CFD Simulation and Published Data
Akashi, M.	Helmholtz-Zentrum Dresden-Rossendorf	X-ray radiographic visualization of bubbly flows injected by a top submerged lance in a liquid metal layer
Alhems, L.	King Fahd University, Saudi Arabia	Experimental Setup for Performance Testing of Pumps -Challenges and Mitigations
Asad, A.	Technische Universität Bergakademie Freiberg	Numerical Assessment of Reactive Cleaning of Steel Melt in an Induction Crucible Furnace
Bang, K.-H.	Korea Maritime and Ocean University, Korea	Multiphase Flow Modeling of Molten Fuel-Coolant Interactions in Nuclear Reactor Severe Accidents
Bukhari, S.	Brunel University London, UK	Multiphase flow metering using a visualisation technique for the oil and gas industry
Cano Sánchez, R.	Higher Institute of Technology and Applied Science (InSTEC) Havana, Cuba	Thermohydraulic Study of a High Temperature Nuclear Reactor considering contact among fuel elements
Cao, Y.	Technische Universität München	Numerical simulation of compressible air bubble rising in quiescent water with heat transfer
Chudjak, M.	Comenius University Bratislava, Slovakia	Reconstruction of the shape of asymmetric elongated bubble moving in downward liquid flow
Collado, F. J.	University of Zaragoza, Spain	New balances for one-dimensional two-phase flow
Crha, J.	University of Chemistry and Technology, Prague, Czech Republic	Single Rising Bubble - COMSOL and Fluent Comparison
D'Avino, G.	Università degli Studi di Napoli Federico II, Italy	The rheology of a dilute non-Newtonian suspension of rigid aggregates
Enders, F.	Technische Universität Berlin	Numerical Evaluation of the Forces Acting on Single Bubbles Rising in Newtonian and Non-Newtonian Media
Fomichev, E.	Rusal ETC, Russia	Simulation of Solids Flocculation by CFD-PBM
Giefer, P.	Leibniz-Institut für Werkstofforientierte Technologien - IWT, Bremen	Numerical investigation of interfacial stress in liquid-liquid flow through porous structures
Giustini, G.	Imperial College London, UK	Heat transfer during steam bubble departure in nucleate boiling: new evidence from micro-scale simulation and measurements
Hernandez-Avellaneda, A.	Universidad Politecnica de Madrid, Spain	Dry storage cask reflooding analysis using a subchannel geometry with an Eulerian multiphase model
H. Hessenkemper	HZDR, Germany	Airlift reactor - experiment and CFD simulation
Hlawitschka, M.	University of Kaiserslautern	Bubble oscillation: Influence to reactive mass transfer

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Hollingshead, C.	McMaster University, Hamilton, Canada	An Experimental and numerical investigation into the effect of tube array geometry on the single-phase velocity field during Natural Circulation
Höhne, T.	Helmholtz-Zentrum Dresden-Rossendorf	Stratified & Segregated Flow Modelling - Interfacial Area Density Models - AIAD
Hundshagen, M.	Ruhr Universität Bochum	Numerical Investigation of Centrifugal Pumps for Gas-Laden Liquids with Closed and Semi-Open Impellers
In, W. K.	Korea Atomic Energy Research Institute, Daejeon, Korea	Reflood quenching of uncoated and CrAl-coated Zircaloy-4 claddings in single tube
Ishimoto, J.	Tohoku University, Japan	Coupled peridynamics and Euler method for leaked hydrogen-air mixing with crack propagation of solid wall
Kanjilal, S.	Johannes Kepler Universität, Linz, Austria	A revised coarse grain approach in simulation of hopper flow with polydisperse particles
Karp, J.	Federal University of Technology - Paraná, Brazil	On the Dynamics of Oil Encapsulated Bubbles
Katrilaka, Ch.	Aristotle University of Thessaloniki, Greece	CFD study of the co-current horizontal flow of a Newtonian & a non-Newtonian fluid in a μ -channel: Effect of non-Newtonian rheology on slug formation
Kolesov, E.	Mining Institute of the Ural Branch of the Russian Academy of Science Perm	Numerical simulation of exhaust gas dilution in blind headings of underground mines
Y. Liao	HZDR, Germany	Baseline Model for Two-Fluid CFD-Simulation of Dispersed Bubbly Flow
Liu, X.	University of Strathclyde Glasgow, UK	A Novel Method of Predicting Two-Phase Flow Patterns in Inclined Pipes via Machine Learning by TensorFlow
Lobanov, P.	Kutateladze Institute of Thermophysics SB RAS, Novosibirsk, Russia	Experimental investigation of gas phase distribution and heat transfer in two phase gas-liquid flow in a rod bundle
Ma, L.	iPhase Ltd., UK	Two-phase gas-liquid intermittent structures in co-current horizontal flow. Part I: Flow patterns and dimensionless characterisation
Mahmud, T.	University of Leeds, UK	Coupled Multiphase CFD-Population Balance Modelling of Cooling Crystallisation Process
Marino, J.	Technische Universität Darmstadt	A new Modified Normalized Weighting Factor method for efficiency improvement of High-Resolution convective schemes in the context of multiphase flows
Narayan, N.M.	Universität Bremen	A 3D-Multiphase Numerical Analysis of Intensive Cooling of Metal Plates
Nöpel, J.	Technische Universität Dresden	Experimental investigation of local conditions for chemical conversion of a dye by hydrodynamic cavitation
Norouzi, M.	Universitat Rovira i Virgili Tarragona, Spain	Deformation, orientation and spatial distribution of long flexible fibers in viscous flows

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Obiso, D.	CIC Virtuhcon, TU Bergakademie Freiberg	Validation of a VOF approach for the Top-Submerged gas injection in liquid metal
Ochoa, S.	Karlsruhe Institute of Technology	Mercury Ring Pump Modelling: Concepts, Progress and Challenges
Oyegbile, B.	Stellenbosch University South Africa	Coupled Eulerian-Lagrangian Modelling of Non-Cohesive Particle Dispersion in an Enclosed Batchelor Flow
Park, H.S.	POSTECH Pohang, Korea	Applicability of the CFD-DEM algorithm on the prediction of single-phase flow pressure drop in porous media with the particle size distribution
Petersen, J.	NORCE Norwegian Research Centre AS, Bergen, Norway	Study of the interaction between spherical particles of different sizes in horizontal fluid flow in a pipe - Experiment, static and dynamic modelling
Preiss, F. J.	Karlsruhe Institute of Technology	Investigation on the stress history in orifices and resulting droplet deformation during high-pressure homogenization
Rajabnia, H.	Sabancı University, Istanbul, Turkey	Experimental Investigation of the effect of external magnetic field on nucleate pool boiling heat transfer of ferrofluid on modified surfaces
Rzehak, R.	Helmholtz-Zentrum Dresden-Rossendorf	Euler-Euler Simulation of Fluid Dynamics and Mass Transfer in Bubbly Flows
Saleh, S.	University of Tikrit, Irak	CFD simulation of hydrodynamic of Ebullated Bed Reactor (EBR) for heavy oil hydroprocessing
Schäfer, J.	Technische Universität Kaiserslautern	Evaluation of droplet size distribution in a mixer-settler using a convolutional neural network
Schlegel, F.	Helmholtz-Zentrum Dresden-Rossendorf	A flow pattern adaptive multi-field two-fluid concept for turbulent two-phase flows
Schmeyer, E.	Physikalisch-Technische Bundesanstalt (PTB), Berlin	Comparison of flow structures for different geometries
Schmitt, P.	Technische Universität Kaiserslautern	Experimental and numerical study on droplet breakup in a centrifugal pump
Semin, M.	Mining Institute of the Ural Branch of the Russian Academy of Sciences, Russia	Numerical simulation of heat and mass transfer in water-saturated porous rock during freezing
Spanos, G. M.	Aristotle University of Thessaloniki, Greece	Hydrodynamic characteristics of free-flowing non-Newtonian liquid film in open inclined microchannel: Experimental investigation
Trofa, M.	Università di Napoli Federico II, Italy	Hydrodynamic drag of particles with complex shapes in a power-law fluid
Vachaparambil, K.	Norwegian University of Science and Technology (NTNU) Trondheim, Norway	Spurious velocities in the Volume of Fluid method: modeling a sub-millimeter bubble
Wickert, D.	Technische Universität Dresden	Simulation of water evaporation under natural conditions - a state of the art overview
Wirz, D.	Technische Universität Kaiserslautern	Experimental and numerical investigation of hydrodynamics in a DN 300 pumpmix mixer

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Zedler, P.	Technische Universität Dresden	Experimental investigation of passive heat removal systems for spent fuel pools
Zhao, Q.	State Key Lab. Multiphase Flow in Power Eng., Xi'an Jiaotong University, China	Heat transfer character of steam submerged jet condensation