

EFCE Spotlight Talks

Working Party on
Multiphase Fluid Flow

20 April
2022

09:30 am • 12:30 pm

CEST

Population Balance Modeling in Gas-Liquid Flows: A Key to More Reliable Process Design



EFCE

For a successful design of gas-liquid reactors such as aerated stirred tanks or bubble columns, a thorough understanding of the fluid mechanics of gas-liquid flows is essential. The mechanics of gas-liquid flow is profoundly dependent on the bubble size distribution: Depending on the bubbles size, their shape and rise velocity vary, which has a strong effect on buoyancy-driven flows and thus on gas hold-up, mixing, shear stress, residence time distribution, and mass transfer performance, which in turn can affect the yield and selectivity of chemical and biochemical reactions. Therefore, for designing climate-friendly and sustainable processes with low resource consumption and reduced emissions, the reliable predictability and control of bubble size distribution plays a key role. This Spotlight Talk will cover current developments and requirements for population balance modeling from both academic and industry perspectives. New experimental and numerical methods will be presented to inspire the next generation of Population Balance Models.

PROGRAM

- 09:30 **Welcome and introduction**
Michael Schlüter – Chair WP Multiphase Fluid Flow, Hamburg University of Technology - Germany
Jarka Glassey, EFCE Executive Vice-President
- 09:40 **Bubble size measurements and population balance modelling of bubbly flows: from lab cases to (more) industrial conditions**
Frédéric Augier, IFP Energies Nouvelles, Lyon - France
- 10:10 **PBM for bubbly flows in industry – small-scale experiments & large-scale applications**
Julia Hofinger, Sebastian Meinicke, Oliver Bey, Arne Hoffmann, Kai Ehrhardt
BASF SE, Ludwigshafen – Germany
- 10:40 *Coffee break*
- 10:50 **Recent advances on bubbly flows modelling: population balances and large-eddy simulations**
Antonio Buffo, Francesco Maniscalco, Mohsen Shiea, Marco Vanni, Daniele Marchisio
Politecnico di Torino - Italy
- 11:20 **Experimental investigation of the heterogeneous regime in bubble columns: from the design of a new Doppler probe to bubble size distribution and velocity measurements**
Martin Obligado, Alain Cartellier, University Grenoble Alpes - France
- 11:50 **Discussion**
- 12:30 **Final remarks and end of the Spotlight Talk**
Michael Schlüter – Chair WP Multiphase Fluid Flow, Hamburg University of Technology - Germany

Registration

free of charge but mandatory

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