EFCE Spotlight Talks

Working Parties on Agglomeration and Multiphase Fluid Flow

12 November 2024

09:30-12:00 CET

EFCE

Multiphase flows in gases and liquids - Similarities and differences of particles and bubbles in gases and liquids
Can we utilise synergies?

For several decades, the experimental analysis, modelling and numerical simulation of multiphase flows has been intensively developed for the design, scale-up and process control of industrial equipment such as bubble column and stirred tank reactors as well as fluidised beds and spray dryers. Major advances in computing power and miniaturisation have made it possible to gain deep insights into local phenomena, and interaction forces between particles and highly dynamic processes can be considered in modelling and numerical simulations. However, as the level of detail increased, the experiments and simulations became more and more complex, so that the two disciplines for the continuous gaseous and the continuous liquid phase developed largely independently of each other. Today, with high performance computing and artificial intelligence we might have the chance to use synergies between both disciplines more intensively than ever before. The experimental and numerical analysis of streamlines is one of the examples where local effects and fluid-particle interactions in gases and liquids can show interesting similarities that are worth discussing in detail [1, 2]. With our Spotlight Talk, we want to bring together international experts, interested scientists and the next generation of multiphase researchers from academia and industry to uncover the potential synergies.

[1] Hoffmann, Arne and Meinicke, Sebastian: Streamline analysis of CFD simulations to evaluate the process performance of stirred tank reactors, EFCE Spotlight Talk, 25.05.2023.
[2] Weiland, Christian and von Kameke, Alexandra and Schlüter, Michael: Trajectory-Based Breakup Modelling for Dense Bubbly Flows. Available at SSRN: https://ssrn.com/abstract=4849246.

PROGRAM

09:30   **Welcome and introduction**
Prof. Stefan Heinrich, Chair of the Working Party on Agglomeration
Prof. Michael Schlüter, Chair of the Working Party on Multiphase Fluid Flow
Giorgio Veronesi, EFCE President

09:40   **Recurrence Computational Fluid Dynamics (rCFD): from slow offline simulations to digital twins of industrial processes.**
Stefan Pirker, Daniel Queteschiner, Stefan Puttinger, Johannes Kepler Univ., Linz - Austria

10:10   **Flowsheet modelling of solids in the chemical industry**
Frank Kleine Jäger, BASF SE, Ludwigshafen - Germany

10:40   **Bubble column reactors : scale-up, modeling, and similarities with fluidized beds**
Frederic Augier, Mathieu Morin, IFP Energies Nouvelles, Lyon - France

17:40   **Nuclear techniques for detailed investigation of cohesive particle flows**
Gabrie Meesters, Ruud van Ommen, TU Delft - The Netherlands

11:40   **Discussion – what can we learn from each other?**

REGISTRATION

free of charge but mandatory

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