14th World Congress on Computational Mechanics (WCCM XIV)
8th European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2020)
July19- 24, 2020, Paris, France

MULTISCALE AND MULTIPHASE FLOWS

TRACK NUMBER 300 / 600

PROF. DR. SC. HRVOJE JASAK*, DR.-ING HOLGER MARSCHALL†

* Faculty of Mechanical Engineering and Naval Architecture
University of Zagreb,
Ivana Lucica 5, 10000 Zagreb, Croatia
E-mail: hrvoje.jasak@fsb.hr
Website: https://foam-extend.fsb.hr/about-us/hrvoje-jasak/

†Mathematical Modeling and Analysis,
Technical University Darmstadt,
Alarich-Weiss Straße 10, D-64287 Darmstadt, Germany
E-mail: marschall@mma.tu-darmstadt.de
Website: www.holger-marschall.info

Key words: Computational Multiphase Flow, Computational Fluid Dynamics.

ABSTRACT

Considering the vast importance of multiphase flows in various applications ranging from medicine to aeronautics and the growing importance of Computational Fluid Dynamics in multiphase flows, we intend to organise a mini-symposium as a part of WCCM-ECCOMAS 2020 Congress.

This mini-symposium shall focus on numerical methods with emphasis on recent developments, new research ideas, techniques, and directions in the field of Multiphase Computational Fluid Dynamics and Transport Phenomena. It is on advanced numerical techniques and methods as well as rigorous modelling with emphasis on multiphase flows as part of Multiscale and Multiphysics Systems.

We seek to keep the mini-symposium focused on advanced methodologies, concerned with scale-bridging approaches for numerical simulations of multiscale transport problems in multiphase systems. For example, this includes approaches to cope with flow regime transition (dispersed vs. segregated flow) in industrial scale multiphase flow, but also – at the other end of the scale range – hybrid atomistic continuum methods, where Molecular Dynamics is coupled to continuum physics so as to resolve detailed physics at contact lines in wetting processes at microscale.

Contributions to this mini-symposium should in particular focus on central numerical aspects such as conservation, accuracy, fidelity, boundedness, stability, convergence, etc. and/or computational costs, parallelization, efficiency, implementation complexity etc.

The topic of this mini-symposium is aligned with foci of the collaborative research centres CRC 1194 "Interaction between Transport and Wetting Processes" and CRC-TRR 150 "Turbulent, Chemically Reactive, Multi-Phase Flows near Walls" of the German Research Foundation (DFG). There is the possibility for reimbursement of travelling expenses of the keynote speaker.