Advances in Multiphase Flow Simulation with Machine Learning

Guest Editors:

Dr. Chaouki Habchi
IFP Energies Nouvelles, Institut Carnot Transports Energies, 1 et 4 Avenue de Bois-Préau, 92852 Rueil-Malmaison, France

Dr. Michele Battistoni
Department of Engineering, University of Perugia, 06123 Perugia, Italy

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Message from the Guest Editors

Dear Colleagues,

E-fuels (such as hydrogen, ammonia and methanol) have been identified to replace fossil fuels and promote carbon-free transport and decentralized power generation with gas turbines, for example. This is why multiphase computational fluid dynamics (CFD) simulation is a hot topic in many research laboratories and industry today. These developments will require precise answers to several open questions of a fundamental scientific nature. For this, fast, robust and accurate CFD models are needed to go beyond academic simulations and reduce the time and cost of developing cutting-edge technologies capable of combating global warming. However, multi-dimensional numerical simulation is generally computationally expensive and can require significant memory capacity, for example, to store the physical properties of the e-fuels over a wide range of pressures, temperatures and compositions. The aim of this Special Issue is to demonstrate the efficiency and robustness of CFD simulation when the numerical solver is coupled with an artificial intelligence method, such as deep learning.

Dr. Chaouki Habchi
Dr. Michele Battistoni
Guest Editors

Special Issue

Editor-in-Chief

Prof. Dr. D. Andrew S. Rees
Department of Mechanical
Engineering, University of Bath,
Bath BA2 7AY, UK

Message from the Editor-in-Chief

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