ETH zürich

Institute of Fluid Dynamics
Institute of Energy and Process Engineering

Colloquium Thermo- and Fluid Dynamics

Modelling and computation of drops and bubbles in turbulence

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Interfaces are a macroscopic perception of molecular properties, and grant the existence of drops and bubbles. Their role is enormously important in a number of environmental and industrial processes: it is across interfaces that momentum, heat and mass transfer fluxes occur. We will briefly review current physics modelling and computational methods to track interfaces focusing on the phase-field approach, in which the phase distribution is a field described by the order parameter ϕ. We will present flow instances and phenomena in which surface tension, density and viscosity are varied, also examining transfer mechanisms of passive scalars and the role of surfactants in altering topological changes of drops (breakage and coalescence) in connection with the characteristics of turbulence.

Alfredo Soldati is professor of Fluid Mechanics and director of the Institute of Fluid Mechanics and Heat Transfer at TU Wien, Austria and part time professor at the University of Udine, Italy. His research focuses on physics and engineering of multiphase flows. Dr. Soldati received the 2007 ASME Robert Knapp award, the 2015 ASME Lewis Moody award, and in 2020 the ASME Freeman Scholarship. In 2013 he was elected Fellow of the American Physical Society and in 2020 was elected fellow of EUROMECH. In 2018 he received the International Prize and Gold Medal Panetti-Ferrari 2018 from Accademia delle Scienze, Torino, Italia. He is currently the Rector of the International Center for Mechanical Sciences (CISM) and the co-Editor in Chief of International Journal of Multiphase Flow.

Date: Wednesday, 22 February 2023
Time: 16:15 – 17:30
Place: ETH Zurich, ML H 44
Host: Prof. Filippo Coletti, IFD

Further information: https://ifd.ethz.ch/events/ktf.html

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